Berry's Cr. 104e Response Ganes Chem (Siegfried)
Vol 1 of 2

PRELIMINARY ASSESSMENT REPORT
NJDEP CASE NO. E99826

Ganes Chemicals Inc.
611-641 Broad Street
Bergen County
Carlstadt, New Jersey 07072

April 18, 2000

Prepared for:

Ganes Chemicals Inc.
33 Industrial Park Road
Pennsville, New Jersey 08070

Prepared By:

McLaren/Hart, Inc.
470 Norristown Road
Suite 300
Blue Bell, Pennsylvania 19422

447692

SCIENCE • STRATEGY • TECHNOLOGY • SOLUTIONS

TABLE OF CONTENTS
PRELIMINARY ASSESSMENT REPORT
GANES CHEMICALS, INC.

TABLE OF CONTENTS

PRELIMINARY ASSESSMENT REPORT
GANES CHEMICALS, INC.

PRELIMINARY ASSESSMENT REPORT

4/98

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF RESPONSIBLE PARTY SITE REMEDIATION
P.O. Box 435, TRENTON, NJ 08625-0435

PRELIMINARY ASSESSMENT REPORT

Answer all questions. Should you encounter any problems in completing this form, we recommend that you discuss the matter with a representative from the Site Remediation Program. Submitting incorrect or insufficient data may cause processing delays and possible postponement of your transaction

PLEASE PRINT OR TYPE

Date: **January 22, 2000**

Industrial Establishment/Site Name **Ganes Chemicals, Inc.**

Address **611-641 Broad Street**

City or Town **Carlstadt** Zip Code **07072**

Municipality **Carlstadt Borough** County **Bergen**

Block (s) **Block 18** Lots (s) **Lots 6, 7, 8, 9 and 10**

Block 19 **Lots 9, 10 and 11**

Block 2 **Lot 8**

Block 23 **Lots 1, 1A, 1B and 2**

Site Remediation Program Case Number or EPA Identification Number **E99826**

1. Present a history of ownership and operations at the industrial establishment, in tabular form, from the time the site was naturally vegetated or utilized as farmland in accordance with N.J.A.C. 7:26E-3.1(c)1.i.

   Refer to Appendix A-1 for complete "Property Ownership Summary", Appendix A-2 for "Tax Assessment Maps", and Appendix A-3 for "Historical Chain of Title Reports".

2A. In accordance with N.J.A.C. 7:26E-3.1(c)1.ii, provide a clear and concise description of the past industrial/commercial operation(s) conducted on site by each owner and operator. To the extent available the site history shall include an evaluation of the following sources of information:

   (1) Sanborn Fire Insurance Maps; (2) MacRae's Industrial Directory; (3) Title and Deed; (4) Site plans and facility as-built drawings; (5) federal, state, county and local government files; (6) The Department Geographic Information System. (7) and any additional sources which may be available for a specific site.

Provide the page or appendix number where the site history may be found. ***Refer to Appendix B-1 "Historical Information Review" and Appendix B-2 "Description of Current and Historical Operations". Also, refer to Appendix J for Historical Site Plans, Sanborn Maps and Aerial Photographs.***

Provide a listing of the resources utilized to compile the site history and as appropriate copies of any maps or information, which will assist the Department in evaluating your conclusions.

Name of Resource	**Date of document reviewed**	**Appendix # if providing copies**
Sanborn Fire Insurance Maps	1902, 1909, 1917, 1922, 1951 and 1968	Appendix J-2
Chain of Title Report/Property Deeds	1894-1998	Appendix A-3
Historical Site Plans	1924, 1946, 1949, 1964, 1977, 1981 and 1998	Appendix J-1
Aerial Photographs	1932, 1940, 1946, 1951, 1971, 1978, 1987, and 1995	Appendix J-3 (1946 and 1987 provided)

2B. Include a detailed description of the most recent operations subject to this preliminary assessment

Provide the page or appendix # where the description of the most recent operations may be found. ***Appendix B-2 "Description of Current and Historical Operations".***

3. Hazardous Substance/Waste Inventory: N.J.A.C. 7:26E-3.1(c)1.iii. List all raw materials, finished-products, formulations and hazardous substances, hazardous wastes, hazardous constituents and pollutants, including intermediates and by-products that are or were historically present on the site. Note: If past usage included farming, pesticides may be a concern and should be included in this list.

Refer to Appendix C-1 for "Finished and Intermediate Products Manufactured", Appendix C-2 "Hazardous Material Usage", and Appendix C-3 "Hazardous Waste Generation".

4A. In accordance with N.J.A.C. 7:26E-3.1(c)1iv provide a summary of all current and historic wastewater discharges of **Sanitary and/or Industrial Waste** and/or sanitary sludges. Present and past production processes, including dates, and their respective water use shall be identified and evaluated, including ultimate and potential discharge and disposal points and how and where materials are or were received on-site. All discharge and disposal points shall be clearly depicted on a scaled site map.

Discharge Period		**Discharge Type**	**Discharge Location**
From	To	N/A	N/A
1909	1980	Sanitary/Industrial/Stormwater	Carlstadt Joint Meeting Sewage Treatment Plant in East Rutherford
1980	Present	Sanitary/Industrial/Stormwater	Bergen County Utility Authority, Little Ferry Treatment Plant

Please refer to Figure "Drainage Systems" (Appendix J-3) for sewer line and discharge outfall locations. Discharges are discussed in Appendix D-1 "Description of Wastewater Discharges", Appendix D-2 "Industrial Wastewater Discharge Permit", and Appendix D-3 "NJPDES Discharge Permit".

4B. Provide a narrative of disposal processes for all historic and current process waste streams and disposal points.

Refer to *Appendix C-4 "Description of Current and Historical Waste Streams"*

5. This question requires the applicant to conduct a diligent inquiry into the current and historic operations at the site to identify all of the potential areas of concern, which formerly or currently exists at the industrial establishment as defined in N.J.A.C. 7:26E-1.8.

Diligent inquiry as defined in N.J.A.C.7:26E-1.8 states:

A. Conducting a diligent search of all documents which are reasonably likely to contain information related to the object of the inquiry, which documents are in such person's possession, custody or control, or in the possession, custody or control of any other person from whom the person conducting the search has a legal right to obtain such documents; and

B. Making reasonable inquiries of current and former employees and agents whose duties include or included any responsibility for hazardous substances, hazardous wastes, hazardous constituents, or pollutants, and any other current and former employees or agents who may have knowledge or documents relevant to the inquiry.

In accordance with N.J.A.C. 7:26E3.1(c)1.v., a narrative shall be provided for each area of environmental concern describing the **(A)** Type; **(B)** Age; **(C)** Dimensions of each container/area; **(D)** Chemical Content; **(E)** Volume; **(F)** Construction materials; **(G)** Location; **(H)** Integrity (i.e., tank test reports, description of drum storage pad); and **(I)** Inventory control records, unless a Department-approved leak detection system, pursuant to N.J.A.C. 7:1E or 7:14B, has always been in place and there is no discharge history. If sampling is not proposed for any identified area of environmental concern, please explain why it is believed that the area of environmental concern does not contain contaminants above the applicable remediation standards. Submit all necessary documentation to verify this belief. The required narrative need not describe the sampling to be completed; however, it should state that sampling will be completed in accordance with the appropriate section of N.J.A.C.7:26E. Detailed descriptions of all remediation activities shall be described in the site investigation report in accordance with N.J.A.C.7:26E-3.13. Note: If the industrial establishment has multiple locations for one type of area of concern (example: underground storage tanks are located in 3 separate areas of the facility), each area must be discussed separately.

Please indicate if any of the potential areas of environmental concern listed below in #5A through #5G, as defined in N.J.A.C. 7:26E-1.8, formerly or currently exist at the industrial establishment by indicating Yes or No in the appropriate space as provided.

For the Location Reference Keyed to Site Map, use either a number or letter identification and be consistent throughout each phase of the remediation, referring to the same identification provided herein.

I hereby certify that a diligent inquiry has been conducted to identify all current and historical potential areas of environmental concern and based on the diligent inquiry the areas of environmental concern identified below in question 5A through 5G are the only areas of environmental concern believed to exist at the above referenced industrial establishment.

Due to the complexity of the property structures, history and number of AOCs identified in the general areas, areas will be address by the appropriate lot number, in doing so, the AOC identification numbering system does not progress in numerical order. Tables providing descriptions of AOCs including bulk underground storage tanks (Appendix E-1), bulk aboveground storage tanks (Appendix E-2), material storage areas (Appendix E-3) and drainage systems (Appendix E-4) have been included in Appendix E.

Building interior areas (Appendix E-5) have been addressed via drainage systems due to the fact that every room within the subject GSFP, OSFP and GSWP historically and/or currently contain trenching systems to contain wastewater.

A. Bulk Storage Tanks and Appurtenances, including, without limitation:
Photographs provided in ***Appendix I*** and referenced throughout the Narrative attached as

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Aboveground Storage Tanks and Associated Piping	Yes	Appendix J-1, Bulk Storage Tanks, AOCs ATA-19 through 24	Appendix E-2 (Descriptions) & E-6 (Narrative)
Underground Storage Tanks and Associated Piping	Yes	Appendix J-1, Bulk Storage Tanks, AOCs UTA-1 through 18	Appendix E-1 (Descriptions) & E-6 (Narrative)
Silos	No	N/A	N/A
Rail Cars	No	N/A	N/A
Loading and unloading areas	Yes	Appendix J-2, Material Storage and Other Areas, AOC MSA-31	Appendix E-3 (Description) & E-6 (Narrative)
Piping, above ground and below ground pumping stations, sumps and pits	Yes	Assessed as ASTs/USTs	Appendix E-1 & E-2 (Descriptions) & E-6 (Narrative)

B. Storage and Staging Areas, including
Photographs provided in ***Appendix I*** and referenced throughout the Narratives.

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Storage pads including drum and/or waste storage	Yes	Appendix J-2, Material Storage and Other Areas, AOCs MSA-26, 28, 30, 34, 35, & 45	Appendix E-3 (Descriptions) & E-6(Narrative)
Surface impoundments and lagoons	No	N/A	N/A
Dumpsters	Yes	Appendix J-2, Material Storage and Other Areas, AOC MSA-28	Appendix E-3 (Description) & E-6 (Narrative)
Chemical storage cabinets or closets	Yes	Appendix J-2, Material Storage and Other Areas, AOCs MSA-36, 38, & 39	Appendix E-3 (Descriptions) & E-6 (Narrative)

C. Drainage systems and areas including without limitation
Photographs provided in ***Appendix I*** and referenced throughout the Narratives.

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Floor drains, trenches and piping and sumps	Yes	Appendix J-3, Drainage Systems, AOCs DS-48-66, 70-81, & 83	Appendix E-4 (Descriptions) & E-6 (Narrative)
Process area sinks and piping which receive process waste	Yes	Appendix J-3, Drainage Systems, AOCs DS-56, 57, 59, 75, & 76	Appendix E-4 (Descriptions) & E-6 (Narrative)
Roof leaders when process operations vent to the roof	Yes	Appendix J-3, Drainage Systems, AOC DS-68	Appendix E-4 & E-5 (Description) & E-6 (Narrative)
Drainage swales & culverts	Yes	Appendix J-3, Drainage Systems, AOCs DS-66-68, & 82	Appendix E-4 (Descriptions) & E-6 (Narrative)
Storm sewer collection systems	Yes	Appendix J-3, Drainage Systems, AOCs DS-66-74 & 82	Appendix E-4 (Descriptions) & E-6 (Narrative)
Storm water detention ponds and fire ponds	No	N/A	N/A
Surface water bodies	No	N/A	N/A
Septic systems leachfields or seepage pits	No	N/A	N/A

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Drywells and sumps	Yes	See Floor Drain, Trenches & Piping & Sumps	Appendix E-4 (Descriptions) & E-6 (Narrative)

D. **Discharge and disposal areas, including, without limitation**:
Photographs provided in ***Appendix I*** and referenced throughout the Narratives.

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Areas of discharge per N.J.A.C. 7:1E	No	N/A	N/A
Waste piles as defined by N.J.A.C 7:26	Yes	Appendix J-2, Material Storage and Other Areas, AOC MSA-28	Appendix E-3 (Description) & E-6(Narrative)
Waste water collection systems including septic systems, seepage pits, & dry wells.	Yes	Appendix J-1 & J-3, Bulk Storage Tank Areas, AOCs UTA-1 & 16 and Discharge Systems, AOCs DS-67, 69, & 71	Appendix E-1 (Descriptions)/E-6 (Narrative) and E-4 (Descriptions)/E-6 (Narrative)
Landfills or landfarms	No	N/A	N/A
Sprayfields	No	N/A	N/A
Incinerators	No	N/A	N/A
Historic Fill or any other Fill material	No	N/A	N/A
Open Pipe discharges	No	N/A	N/A

E. **Other areas of concern, including, without limitation:**
Photographs provided in ***Appendix I*** and referenced throughout the Narratives.

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Electrical Transformers & Capacitors	Yes	Appendix J-2, Material Storage and Other Areas, AOCs-84, 85, & 86	Appendix E-5 (Narrative)
Hazardous material storage or handling areas	Yes	Appendix J,-2 Material Storage and Other Areas, AOCs MSA-31, 33, 35, & 46	Appendix E-3 (Descriptions) & E-6 (Narrative)
Waste Treatment areas	No	N/A	N/A
Discolored or spill areas	Yes	As noted in Discharge Areas	N/A

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Open areas away from production areas	No	N/A	N/A
Areas of stressed vegetation	No	N/A	N/A
Underground piping including industrial process sewers	Yes	As Noted in Discharge Areas	Appendix E-4 (Descriptions) & E-6 (Narrative)
Compressor vent discharges	Yes	Appendix J-3, Material Storage and Other Areas, AOC MSA-37	Appendix E-3 (Description) & E-6 (Narrative)
Non-contact cooling water discharges	Yes	As Noted in Discharge Areas	N/A
Areas which receive flood or storm water from potentially contaminated areas	No	N/A	N/A
Active or Inactive production wells	Yes	Appendix J-2, Material Storage and Other Areas, AOCs-87 through 89	Appendix E-5 (Descriptions) & E-6 (Narrative)

F. **Building interior areas with a potential for discharge to the environment, including, without limitation**:
Photographs provided in ***Appendix I*** and referenced throughout the Narratives.

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Loading or Transfer areas	Yes	Appendix J-2, Material Storage and Other Areas, AOCs MSA-25 & 44	Appendix E-3 (Descriptions) & E-6 (Narrative)
Waste Treatment areas	No	N/A	N/A
Boiler rooms	Yes	Appendix J-2, Material Storage and Other Areas, AOCs MSA-29 and Discharge Areas, AOC DS-59	Appendix E-3 (Description)/E-6 (Narrative) and Appendix E-4/(Description)/E-6 (Narrative)
Air vents and ducts	Yes	N/A	Appendix E-5 Building Interior Descriptions
Hazardous material storage or handling areas	Yes	Appendix J-2, Material Storage and Other Areas, AOCs MSA-25, 27, 29, 32, 33, 36, 37, 40-44, & 47	Appendix E-3 (Descriptions) & E-6 (Narrative)

G. **Any other site-specific area of concern.**
Photographs provided in ***Appendix I*** and referenced throughout the Narratives.

Area of Concern	Currently or Formerly Exists at the Site Yes/No	Location Referenced to the Site Map	Appendix Number
Suspect Historic Disposal Area	Yes	Appendix J-2, Material Storage and Other Areas, AOC MSA-27	Appendix E-3 (Description) & E-6 (Narrative)

6 If the site area exceeds two acres, an interpretation of the aerial photographic history of the site shall be submitted in accordance with N.J.A.C. 7:26E-3.1(c)1.vi. The interpretation shall be based on available current and historical color, black and white and infrared aerial photographs (scale 1:18,000 or less) of the site and surrounding area at a frequency that provides the evaluator with a historical perspective of site activities. The photographic history shall date back to 1932 or the earliest photograph available. Aerial photographs are available for review at the New Jersey Department of Environmental Protection, Tidelands Management Program, Aerial Photo Library, 9 Ewing Street, Trenton, New Jersey, (609) 633-7369. Note, the applicant is not required to provide the Department with copies of the aerial photographs reviewed only an interpretation of what was observed in each photograph, which may represent an environmental concern.

Provide the appendix number for the air photo review narratives ***Included in Appendix B-1 "Historical Information Review"***

7. Discharge History of Hazardous Substances and Wastes, N.J.A.C. 7:26E-3.1(c)1vii :

A. Have there been any known discharges of hazardous substances and wastes at the site?

_____________ No (Goto question #8) _____X_____Yes (Complete Items 7B & 7C)

B. Was the Department notified of the discharge?

_____X_____Yes; _________ No

If yes, provide the Case # ***Refer to Appendix F-1 "Release Summary"***

C. Was a no-further-action letter, negative-declaration approval or full-compliance letter issued as a result of the cleanup of this discharge?

_____________Yes (Submit a copy of the no-further-action approval)

_____X_____No (Submit a complete Site Investigation or Remedial Action Report documenting the action taken to address the discharge) ***Appendix G***

8. In accordance with N.J.A.C.7:26E-3.1 (c) 1.vii, provide a description of any remediation activities previously conducted or currently underway at the site, including dates of discharges, remedial actions taken, and all existing sample results concerning contaminants which remain at the site. Copies of Department or other governmental agency no-further-action approvals should also be provided with a description of the areas to which the no-further-action approvals apply. This

information is especially important if the approval was granted for the remediation of a portion of a site or a specific discharge event rather than the entire site subject to this preliminary assessment.
____________Check here if this question does not apply.

Provide the appendix number for the required narrative and data summary ***Appendix G***

A Remedial Action Selection Report was submitted to the NJDEP on November 17, 1999.

9. Protectiveness of past remedies, Order of Magnitude Analysis, N.J.A.C. 7:26E-3.1(c) 1.ix & N.J.A.C. 7:26E, 3.2(a)5

A. Have any areas of concern previously received a No-Further-Action approval from the Department or other equivalent government agency for which no additional remediation is proposed? __**X**__No (go to question #10). __________Yes (complete 9B).

B. In accordance with N.J.S.A 58:10B-13(e) the following evaluation of the protectiveness of past remedies shall be completed for all areas of concern for which no further action was previously approved by the Department or other equivalent government agency and for which no additional remediation is proposed. All final sampling results shall be evaluated to determine if contaminant levels remaining on site are in compliance with current remediation criteria. The applicant shall complete the following :

Include a table comparing the levels of contaminants remaining in each area of concern, the numerical remediation standard approved in the remedial action workplan or at the time of no-further-action approval and the numerical remediation standards applicable at the time of the comparison. The table shall contain all sampling results, including sample location, sample media, field and laboratory identification numbers, and method detection limits, as necessary, and analytical results for all individual contaminants for each area of concern.

I hereby certify that the order of magnitude analysis required pursuant to N.J.A.C. 7:26E has been completed, since the issuance of a No-Further-Action approval, negative declaration approval or equivalent remediation approval; and (Check the appropriate statements (1), (2), (3) or (4))

(1) ____The areas of concern listed below contain contaminants above the numerical remediation standard applicable at the time of the comparison, however no further action is required because: (check the appropriate sub statement)

_______(a) The contaminant concentrations remaining in the areas of concern listed below are less than an order of magnitude (factor of 10) greater than the numerical remediation standard applicable at the time of the comparison;

_______(b) The areas of concern or the site was remediated using engineering and institutional controls approved by the Department and these controls are still protective of public health, safety and the environment; or

_______(c) The area of concern or the site was remediated to an approved site specific remediation standard and all of the factors and assumptions which are the basis for deriving the site specific remediation standard remain valid for the site.

Please list the areas of concern for which the previous statement applies.

Area of Concern	Location Reference Keyed to the Site Map

(2) ____ The areas of concern listed below contain contaminants above the numerical remediation standard applicable at the time of the comparison and further remediation is required because: (check the appropriate sub statement)

_______ (a) The contaminant concentrations remaining in the areas of concern listed below are more than an order of magnitude (factor of 10) greater than the numerical remediation standard applicable at the time of the comparison;

_______ (b) The areas of concern or the site was remediated using engineering and institutional controls approved by the Department and these controls are no longer protective of public health, safety and the environment; or

_______(c) The area of concern or the site was remediated to an approved site specific remediation standard and some or all of the factors and assumptions which are the basis for deriving the site specific remediation standard are no longer valid;

Please list the areas of concern for which the previous statement applies.

Area of Concern	Location Reference Keyed to the Site Map

(3) ____ The areas of concern listed below do not contain contaminants above the numerical remediation standard applicable at the time of the comparison and no further remediation is required.

Please list the areas of concern for which the previous statement applies.

Area of Concern	Location Reference Keyed to the Site Map

(4).____The contaminant concentrations remaining in the below listed areas of concern are more than an order of magnitude greater than the numerical remediation standard applicable at the time of the comparison. However, no further remediation is required by the person conducting this preliminary assessment, because, in accordance with N.J.S.A. 58:10B13(e), that person is not liable for the contamination pursuant to N.J.S.A. 58:10-23.11g

Please list the areas of concern for which the previous statement applies.

Area of Concern	Location Reference Keyed to the Site Map

10 Historical Data on environmental quality at the Industrial Establishment

A. Have any previous sampling results documenting environmental quality of the Industrial Establishment not received a no further action approval from the Department or been denied approval by the Department? (N.J.A.C. 7:26E-3.1(c)1.viii)

_______Yes (See Attachment #_____) ______ No (Go to 11)

B. Have there been any known changes in site conditions or new information developed since completion of previous sampling or remediation? If sampling results were obtained, but are not part of this application, please explain below (N.J.A.C. 7:26E-3.1©xi):

____

____

11 List all federal, state and local environmental permits at this facility, including permits for all previous and current owners or operators, applied for, received, or both.

A. New Jersey Air Pollution Control

Permit Number	Expiration Date	Type of Permitted Unit
125353	04/01/01	Pilot plant facility
01-97-4427	06/24/03	Batch plant
122988	09/19/01	Boiler: NJ Stack No. 12
118110	10/29/01	Boiler: NJ Stack No. 74
01955856	01/12/01	UST: E5 (UST-5)/Ethanol
01955855	01/12/01	UST: E6 (UST-6)/Isopropyl Alcohol
077679	02/28/97 Renewal filed 6/97. No response to date.	UST: E8 (UST-8)/Fuel Oil
01972383	07/31/02	UST: E9 (UST-9)/Toluene
01955857	01/12/01	UST: E10 (UST-10)/Acetic Anhydride
087536	10/24/98 Renewal filed 12/97. No response to date	AST: E13 (AST-13)/Acetic Acid
01955858	01/18/01	AST: E15 (AST-15)/Various
111179	02/24/98 Renewal filed 12/97. No response to date	AST: E25 (AST-25)/Various
01974309	03/24/03	AST: P6/Alcohol-water-salt mixture (Rac-6 ML)
122280	05/15/00	Neutralization Tank

B. Underground Storage Tank Registration Number **0059231 (expires12/31/01)**

Size of Tank (Gallons)	Tank Contents
E5-6,000 (Permit #S90-0449)	Methanol
E6-6,000 (Permit #S90-0449)	Alcohols

E7-6,000 (Permit #S90-0449)	Sodium Hydroxide
E8-15,000(Permit #S91-0139)	#6 Fuel Oil
E9-2,000 (Permit #S91-0140)	Toluene
E10-6,000 (Permit #S91-0141)	Acetic Anhydride

C. New Jersey Pollutant Discharge Elimination System (NJPDES) Permit

Permit Number	Discharge Type	Discharge Location Keyed to Site map	Expiration Date
NJ0104591	Storm Water	DSN 020 and 021 *(Refer to AOC-Drainage Systems Map in Appendix J-3 for locations)*	06/30/98 Renewal application filed 1/98. No response to date.
NJ0052728	Industrial process wastewater to the Carlstadt Joint Meeting Sewage Treatment Plant in East Rutherford ("Significant Indirect Use" Permit)	Outfalls 001-005 *(Refer to AOC-Drainage Systems Map in Appendix J-3 for locations)*	Delisted (Not Permit)

D. Resource Conservation and Recovery Act (RCRA) permit # **N/AP**

E. EPA Identification Number **NJ001213727**

F. In accordance with N.J.A.C. 7:26E-3.1(c) xii, list all other federal, state, local government environmental permits for all previous and current owners or operators applied for and/or received for the site including:

(1) Name and address of the permitting agency
(2) The reason for the permit
(3) The permit identification number
(4) The application date
(5) The date of approval, denial or status of the application
(6) The name and current address of the permittees
(7) The reason for the denial, revocation or suspension if applicable
(8) The permit expiration date

Permitting Agency	Reason for Permit	Permit Number	Expiration Date
Borough of Carlstadt	Smoke permit	324	06/30/99 Waiting renewal notice
Bergen County Utilities Authority (BCUA)	Industrial wastewater discharge to BCUA treatment works	0287 *(Permit has been issued annually to Ganes since 1993)*	02/29/00
		022	03/13/93
		051	03/13/92
		019	03/13/90
		011	03/13/89
NJDEP	Physical connection	0900	03/31/00
NJDEP Water Supply Element	Water allocation permit to divert water from on-site wells	2055P	10/31/98 Renewal application filed 9/98. No response to date.

____________ Check here if no other environmental permits were applied for or received for this site.

Provide the appendix # for the required listing if other environmental permits exist for this site ___None___.

12. In accordance with N.J.A.C. 7:26E-3.1(c)xiii, provide a summary of enforcement actions (including but not limited to, Notice of Violations, Court Orders, official notices or directives) for violations of environmental laws or regulations:

Refer to <u>Appendix H-1</u> "Summary of Enforcement Actions" and Appendix H-2 "Environmental Datebase Report" for descriptions.

A. Check here if no enforcement actions are involved ________ (Go to 13 otherwise complete 12B)

B. (1) Name and address of agency that initiated the enforcement action

______ ***See Appendix H*** ________________________

(2) Date of the enforcement action ________________

(3) Section of statute, rule or permit allegedly violated ____________________

____

____

(4) Type of enforcement ____

____

(5) Description of the violation ____

____

____

(6) How was the violation resolved? ____

____

____

13. In accordance with N.J.A.C. 7:26E-3.1(c) xiv, please provide a narrative description of all areas where non-indigenous fill materials were used to replace soil or raise the topographic elevation of the site, including the dates of emplacement. **None Known**

14. A. In accordance with N.J.A.C. 7:26E-3.2(a) 3.i, submit a scaled site plan, detailing the subject lot and block, property and or leasehold boundaries, location of current and former buildings, fill areas, paved and unpaved areas, vegetated areas, and all areas of concern identified above and all active or inactive wells. ***A scaled Site Plan (Sheet 1 of 4) is provided in the "Figures" section of this document. All Areas of Concern are identified on maps provided in Appendix J.***

B. Scaled historical site maps and facility as built drawings. ***See Appendix K-1***

C. A copy of the United States Geologic Survey (USGS) 7.5 minute topographical quadrangle that includes the site and an area of at least one mile radius around the site. The facility location shall be clearly noted. If a portion of the USGS quadrangle is used, the scale, north arrow, contour interval, longitude and latitude with the name and date of the USGS quadrangle shall be noted on the map.

Provided as Figure 1 in the "Figures" section of this document.

15. In accordance with N.J.A.C. 7:26E-3.2, please provide the date that the site visit was completed to verify the findings of the preliminary assessment. ***November 2, 1999; December 8, 1999; January 11, 2000 and March 29, 2000.***

16. List any other information you are submitting or which has been formerly requested by the Department:

Description	Appendix #
None	

CERTIFICATION:

The following certification shall be signed by the highest-ranking individual at the site with overall responsibility for that site or activity. Where there is no individual at the site with overall responsibility for that site or activity, this certification shall be signed by the individual having responsibility for the overall operation of the site or activity.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information, and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Typed/Printed Name ______________________________ Title ____________________________________

Signature _____________________________________ Date ____________________________

Sworn to and Subscribed Before Me on this _______________________________

Date of ___________________ 19__________

____
Notary

Ganes Chemicals, Inc.
Carlstadt, New Jersey
ISRA Case No. E99826

Division of Responsible Party Site Remediation
Industrial Site Recovery Act

INITIAL NOTICE FEE SUBMITTAL FORM

Case # (if known) E99826

Case Name (Active Case) Ganes Chemicals, Inc.

Check drawn from the account of ______________ Check/M.O. # ______________

Amount Enclosed $250.00

Please circle the appropriate payment location(s)

1.	General Information Notice	$100.00
2.	Preliminary Assessment Report	***$250.00***
3.	Site Investigation Report	$500.00
4.	Negative Declaration Review	$100.00
5.	Expedited Review Application•	$250.00
6.	Remediation in Progress Waiver Application•	$250.00
7.	Regulated Underground Storage Tank Waiver Application•	$500.00
8.	Area of Concern Waiver Application•	$200.00
9.	Limited Site Review Application•	$450.00
10.	Applicability Determination Application	$200.00
11.	De minimis Quantity Exemption Application	$200.00
12.	Limited Conveyance Application•	$500.00
13.	Remediation Agreement Application	$1000.00
	Remediation Agreement Amendment Application	$500.00
14.	Confidentiality Claim	$250.00
15.	Remedial Action Workplan Deferral Application•	$750.00

• This fee includes the costs of the Department's review of the General Information Notice required pursuant to N.J.A.C. 7:26B-3.2(a). Any person submitting this fee shall not be required to submit a separate General Information Notice fee.

Note: All applicable fees are due with the submission of each document. A case will remain with the Initial Notice Section up through the submission of a Remedial Investigation Report or the submission of a schedule to implement a Remedial Investigation or Remedial Action at Peril.

SITE LOCATION MAP

McLaren Hart, Inc.

SITE LOCATION MAP
GANES CHEMICAL, INC. PROPERTY

Carlsdadt, New Jersey

Scale 1" = 2000 Feet

Contour Interval: 10 Feet

North

FIGURE 1

Preliminary Assessment

USGS Topographic Map
Weehawken N.J.-N.Y. Quadrangle
1967, photorevised 1981

FILE NO. 61180318
DATE: 05-02-00
CAD/OP RME

LEGEND

- GRASSY AREAS
- CONCRETE/PAVED AREAS
- GRAVEL AREAS
- MW-10 EXISTING MONITORING WELL
- UST-7 EXISTING UST's/AST's

BUILDING USE

- MFG – MANUFACTURING
- LAB – LABORATORIES
- MTN – MAINTENANCE
- UTL – UTILITY
- STR – STORAGE
- LAB – LABORATORY

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

REV#	DATE	DESCRIPTION	APP'D

GANES CHEMICALS, INC.
CARLSTADT, NEW JERSEY

PROJECT TITLE
PRELIMINARY ASSESSMENT

McLaren/Hart, INC.
470 NORRISTOWN RD
SUITE 300
BLUE BELL, PA.
19422

DRAWING TITLE
SITE PLAN

DATE: 01-17-00	DRWN: FC	DWG NO.	REVISION
SCALE: AS NOTED	CHK'D:		
PROJECT #: 13/0001243	APP'D:	SHEET 1 OF 4	

SITE PLAN (Sheet 1 of 4)

APPENDIX A

HISTORY OF OWNERSHIP
(Question 1)

APPENDIX A-1

PROPERTY OWNERSHIP SUMMARY

GEE
"START"

APPENDIX A-1
PROPERTY OWNERSHIP SUMMARY

The subject property consists of multiple buildings, of varying sizes and uses which occupy 7.923 acres located on four (4) Blocks and thirteen (13) Lots. The improvements on the property consist of an office building, industrial buildings, a research and development center, a quality control lab, residential homes and vacant lots.

For the purposes of this document, the facility has been categorized into four parcel blocks that include:

1. The Garden Street Facility Property (GSFP) (Block 18, Lots 6-10)
2. The Orchard Street Facility Property (OSFP) (Block 19, Lots 9-11)
3. The Garden Street Warehouse Property (GSWP) (Block 2, Lot 8)
4. The Scharg Warehouse Property (SWP) (Block 23, Lots 1, 2, 1A, & 1B)

The following table, which provides a description of the subject property has been categorized into the four parcels as outlined above.

GARDEN STREET FACILITY PROPERTY (GSFP) BLOCK 18, LOTS 6-10						
Address	*Block*	*Lot*	*Improvements (Sq.Ft.)*	*Acres*	*Land (Sq.Ft.)*	*Function*
425 Garden Street	18	6	Paved Parking Lot	0.23	10,019	Parking Area
436 Orchard Street	18	7	House	0.29	12,632	Residential Dwelling
425 Garden Street	18	8	Gravel Parking Lot & Quality Control Lab	0.22	9,583	Parking Area & Quality Control Lab
426 Orchard Street	18	9	Former Research & Development Bldg. (4,446)	0.253	11,021	Research &Development
641 Broad Street	18	10	Industrial Buildings (15,085)	1.1	47,916	Industrial
ORCHARD STREET FACILITY PROPERTY (OSFP) BLOCK 19, LOTS 9-11						
Address	*Block*	*Lot*	*Improvements (Sq.Ft.)*	*Acres*	*Land (Sq.Ft.)*	*Function*
411 Orchard Street	19	9	House	0.115	5,009	Residential/Former Training Room
611 Broad Street	19	10	Industrial Buildings (30,871)	0.481	20,952	Industrial
412 Lincoln Street	19	11	House	0.069	3,006	Residential Dwelling
GARDEN STREET WAREHOUSE PROPERTY (GSWP) BLOCK 2, LOT 8						
Address	*Block*	*Lot*	*Improvements (Sq.Ft.)*	*Acres*	*Land (Sq.Ft.)*	*Function*
326 Garden Street	2	8	Warehouse (9,967)	1.32	57,499	Chemical Warehousing

APPENDIX A-1
PROPERTY OWNERSHIP SUMMARY

The subject property consists of multiple buildings, of varying sizes and uses which occupy 7.923 acres located on four (4) Blocks and thirteen (13) Lots. The improvements on the property consist of an office building, industrial buildings, a research and development center, a quality control lab, residential homes and vacant lots.

For the purposes of this document, the facility has been categorized into four parcel blocks that include:

1. The Garden Street Facility Property (GSFP) (Block 18, Lots 6-10)
2. The Orchard Street Facility Property (OSFP) (Block 19, Lots 9-11)
3. The Garden Street Warehouse Property (GSWP) (Block 2, Lot 8)
4. The Scharg Warehouse Property (SWP) (Block 23, Lots 1, 2, 1A, & 1B)

The following table, which provides a description of the subject property has been categorized into the four parcels as outlined above.

GARDEN STREET FACILITY PROPERTY (GSFP) BLOCK 18, LOTS 6-10						
Address	***Block***	***Lot***	***Improvements (Sq.Ft.)***	***Acres***	***Land (Sq.Ft.)***	***Function***
425 Garden Street	18	6	Paved Parking Lot	0.23	10,019	Parking Area
436 Orchard Street	18	7	House	0.29	12,632	Residential Dwelling
425 Garden Street	18	8	Gravel Parking Lot & Quality Control Lab	0.22	9,583	Parking Area & Quality Control Lab
426 Orchard Street	18	9	Former Research & Development Bldg. (4,446)	0.253	11,021	Research &Development
641 Broad Street	18	10	Industrial Buildings (15,085)	1.1	47,916	Industrial
ORCHARD STREET FACILITY PROPERTY (OSFP) BLOCK 19, LOTS 9-11						
Address	***Block***	***Lot***	***Improvements (Sq.Ft.)***	***Acres***	***Land (Sq.Ft.)***	***Function***
411 Orchard Street	19	9	House	0.115	5,009	Residential/Former Training Room
611 Broad Street	19	10	Industrial Buildings (30,871)	0.481	20,952	Industrial
412 Lincoln Street	19	11	House	0.069	3,006	Residential Dwelling
GARDEN STREET WAREHOUSE PROPERTY (GSWP) BLOCK 2, LOT 8						
Address	***Block***	***Lot***	***Improvements (Sq.Ft.)***	***Acres***	***Land (Sq.Ft.)***	***Function***
326 Garden Street	2	8	Warehouse (9,967)	1.32	57,499	Chemical Warehousing
SCHARG WAREHOUSE PROPERTY (SWP) BLOCK 23, LOTS 1, 2, 1A AND 1B						
Address	***Block***	***Lot***	***Improvements (Sq.Ft.)***	***Acres***	***Land (Sq.Ft.)***	***Function***
630 Broad Street & 637 Hoboken Road	23	1	Office Building & Vacant Industrial Building (70,330)	3.726	162,305	Office/Vacant Industrial
612 Broad Street	23	2	Lot	0.119	5,184	Vacant
622 Broad Street	23	1A	Lot	[1]N/A	[1]N/A	[1]N/A
325 Garden Street	23	1B	Lot	[1]N/A	[1]N/A	[1]N/A

Notes:
[1]N/A = The locations and purchase records for Lots 1A and 1B of Block 23, were not attainable during two ASTM Historical Chain-of-Title-searches and review of City of Carlstadt records. These Lots have therefore been incorporated into and described as Lot 1.

APPENDIX A-1
PROPERTY OWNERSHIP SUMMARY

The following tables, which describe ownership history have been categorized by parcel block and lot numbers.

GARDEN STREET FACILITY PROPERTY (GSFP) (Block 18, Lots 6-10)					
CURRENT LOT #	*HISTORICAL LOT #*	*NAME OF PROPERTY OWNER*	*FROM*	*TO*	*OPERATION*
6	N/AP	Ganes Chemicals, Inc.	[1]Information not available	Dec 1999	Residential/Parking Lot
6	N/AP	[2]Novus Fine Chemicals	Dec. 1999	Present	Residential/Parking Lot
7	Block 9, Lots 26 & 27	Clarence E. Mathe, et ux	Prior to 1900	1939	Part of Residential
		Nicholas Micci, et ux	1939	1966	Residential
		Ganes Chemical Works, Inc.	1966	Dec 1999	Residential
		[2]Novus Fine Chemicals, Inc.	Dec 1999	Present	Residential
8	Block 9, Lots 10-13	Cono Scaffidi Saggio, et ux	Prior to 1900	1936	Residential
		Maria Miragliotta, et vir	1936	1946	Residential
		Catherine Herold	1946	1981	Residential
		Ganes Chemicals, Inc.	1981	Dec. 31, 1999	Quality Control Lab
		[2]Novus Fine Chemicals	Dec 1999	Present	Quality Control Lab
9	Block 9, Lots 22 & 23	Marie Rasmussen, et vir	Prior to 1900	1918	Vacant/Residential
		Antonio Antonicelli, et ux	1918	1960	Residential
		Ganes Chemical Works, Inc.	1960	Dec 1999	R&D Center
		[2]Novus Fine Chemicals, Inc.	Dec 1999	Present	Office Building
	Block 9, Lots 24 & 25	Marie Rasmussen, et vir	Prior to 1900	1918	Vacant/Residential
		Antonio Antonicelli, et ux	1918	1959	Residential
		Angelo Glionna, et ux	1959	1960	Residential
		Ganes Chemical Works, Inc.	1960	Dec 1999	R&D Center
		[2]Novus Fine Chemicals	Dec 1999	Present	Office Building

Notes:
[1]Information Not Available = Two ASTM Historical Chain-of-Title-searchesand a review of City of Carlstadt records were conducted and with no information being generated regarding the historical ownership of Lot 6.
[2]Novus Fine Chemicals, Inc. purchased the Garden and Orchard Street Facility Properties under a Remediation Agreement signed December 20, 1999.

Garden Street Facility Property (GSFP) (Block 18, Lots 6-10) Continued					
Current Lot #	*Historical Lot #*	*Name of Property Owner*	*From*	*To*	*Operation*
10	Portion of Block 9, Lots 1-9 & 14-21	Albert Bolle, et ux	Prior to 1894	1894	Block 10 has been utilized for Manufacturing since prior to the 1900's
		[3]Trubek Chemical Works, Inc.	1894	1934	
	Portion of Block 9, Lots 1-9 & 14-21	H. Charles Euler, et ux	Prior to 1900	1909	
		[3]Trubek Chemical Works, Inc.	1909	1934	
	Portion of Block 9, Lots 1-9 & 14-21	William Mathe, et ux	Prior to 1900	1912	
		Franco-American Chemical Works	1912	1934	
	Entire Lot	Ganes Chemical Works, Inc.	1934	Dec 1999	
	Entire Lot	[2]Novus Fine Chemicals, Inc.	Dec 1999	Present	

Notes:
[2]Novus Fine Chemicals, Inc. purchased the Garden and Orchard Street Facility Properties under a Remediation Agreement signed December 20, 1999.
[3]Name of the Trubek Works changed to Franco-American Chemical Works on March 3, 1909.

Orchard Street Facility Property (OSFP) (Block 19, Lots 9-11)					
Current Lot#	*Historical Lot#*	*Name of Property Owner*	*From*	*To*	*Operation*
9	Block 10, Lots 35 & 36	Geovanni Fillipelli, et ux	Prior to 1900	1927	Undeveloped / Residential
		John Romanelli, et ux	1927	1967	Residential
		Ganes Chemical Works, Inc.	1967	Dec 1999	
		[2]Novus Fine Chemicals, Inc.	Dec 1999	Present	
10	Block 10, Lots 30-34 & 56-58	Moses Trubek	Prior to 1900	1940	Block 10 has been utilized for Manufacturing since the early 1920's
		Ganes Chemical Works, Inc.	1940	Dec 1999	
		[2]Novus Fine Chemicals, Inc.	Dec 1999	Present	
11	Block 10, Lot 59	Henry Hammond, et ux	Prior to 1900	1945	Residential
		Kathleen Kuenzle, et vir	1945	1952	
		Leonard Pati, et ux	1952	1981	
		Anthony Rinaldi, et ux	1981	1988	
		Sharon Rinaldi	1988	1989	
		Ganes Chemicals, Inc.	1989	Dec 1999	
		[2]Novus Fine Chemicals, Inc.	Dec 1999	Present	

Notes:
[2]Novus Fine Chemicals, Inc. purchased the Garden and Orchard Street Facility Properties under a Remediation Agreement signed December 20, 1999.

APPENDIX A-1
PROPERTY OWNERSHIP SUMMARY

GARDEN STREET WAREHOUSE PROPERTY (GSWP) (BLOCK 2, LOT 8)					
CURRENT LOT #	*HISTORICAL LOT #*	*NAME OF PROPERTY OWNER*	*FROM*	*TO*	*OPERATION*
8	N/AP	Michael Ollert	Prior to 1900	1933	Undeveloped occupied by Ball Fields
		William T. Muehling, et ux	1933	1947	
		Ganes Chemical Works, Inc.	1947	Present	Material Storage/Part of Ganes Chemicals

SCHARG WAREHOUSE PROPERTY (SWP) (BLOCK 23, [4]LOTS 1, 2, 1A, AND 1B)					
CURRENT LOT #	*HISTORICAL LOT #*	*NAME OF PROPERTY OWNER*	*FROM*	*TO*	*OPERATION*
1	Block 8	Maria Schreiber, et vir	Prior to 1892	N/A	Unknown
1	Block 8	John Keller, et ux	1892	1903	Residential
1	Block 8	Marie Vitous	1903	1904	Residential
[5]Portion	Block 8	George Zimmerman, et ux	Prior to 1900	1904	Residential
		Erdman E. Scharg and Christof Scharg	1904	1978	Scharg Bros. Silk Factory
[5]Portion	Block 8	George Fleidel, et ux	Prior to 1900	1904	Residential
		Erdman E. Scharg and Christof Scharg	1904	1978	Scharg Bros. Silk Factory
[5]Portion	Block 8	Wilhelmina C. Steinle	Prior to 1900	1947	Residential/Scharg Bros. Silk Factory
	Block 8	Erdman E. Scharg and Christof Scharg	1947	1978	Residential/Scharg Bros. Silk Factory
[5]Portion	Block 8	Erdman E. Scharg and Christof Scharg	1947	1978	Residential/Scharg Bros. Silk Factory
	Block 8	Scharg Brothers, Inc.	1947	1978	Residential/Scharg Bros. Silk Factory
1	Block 8	Marie Vitous, et al (Forclosure)	1960	1960	Residential/Scharg Bros. Silk Factory
1	Block 8	Carl W. Zeidler, et ux	1960	1960	Residential/Scharg Bros. Silk Factory
1	Block 8	Scharg Brothers, Inc.	1960	1978	Residential/Scharg Bros. Silk Factory
1	Block 8	Ganes Chemicals, Inc.	1978	Present	Storage/Office Building

SCHARG WAREHOUSE PROPERTY (SWP) (BLOCK 23, [4]LOTS 1, 2, 1A, AND 1B) CONTINUED					
CURRENT LOT #	*HISTORICAL LOT #*	*NAME OF PROPERTY OWNER*	*FROM*	*TO*	*OPERATION*
2	Block 8	Mary Fill and husband	Prior to 1900	1931	Residential
		Arthur E. Fill and Catherine Fill	1931	1967	
		Louis Van Hentenryck, et ux	1967	1972	
		Ann M. Van Hentenryck	1972	1978	
		John J. Eckert and Joanne Eckert	1978	1998	
		Ganes Chemicals, Inc.	1998	Present	

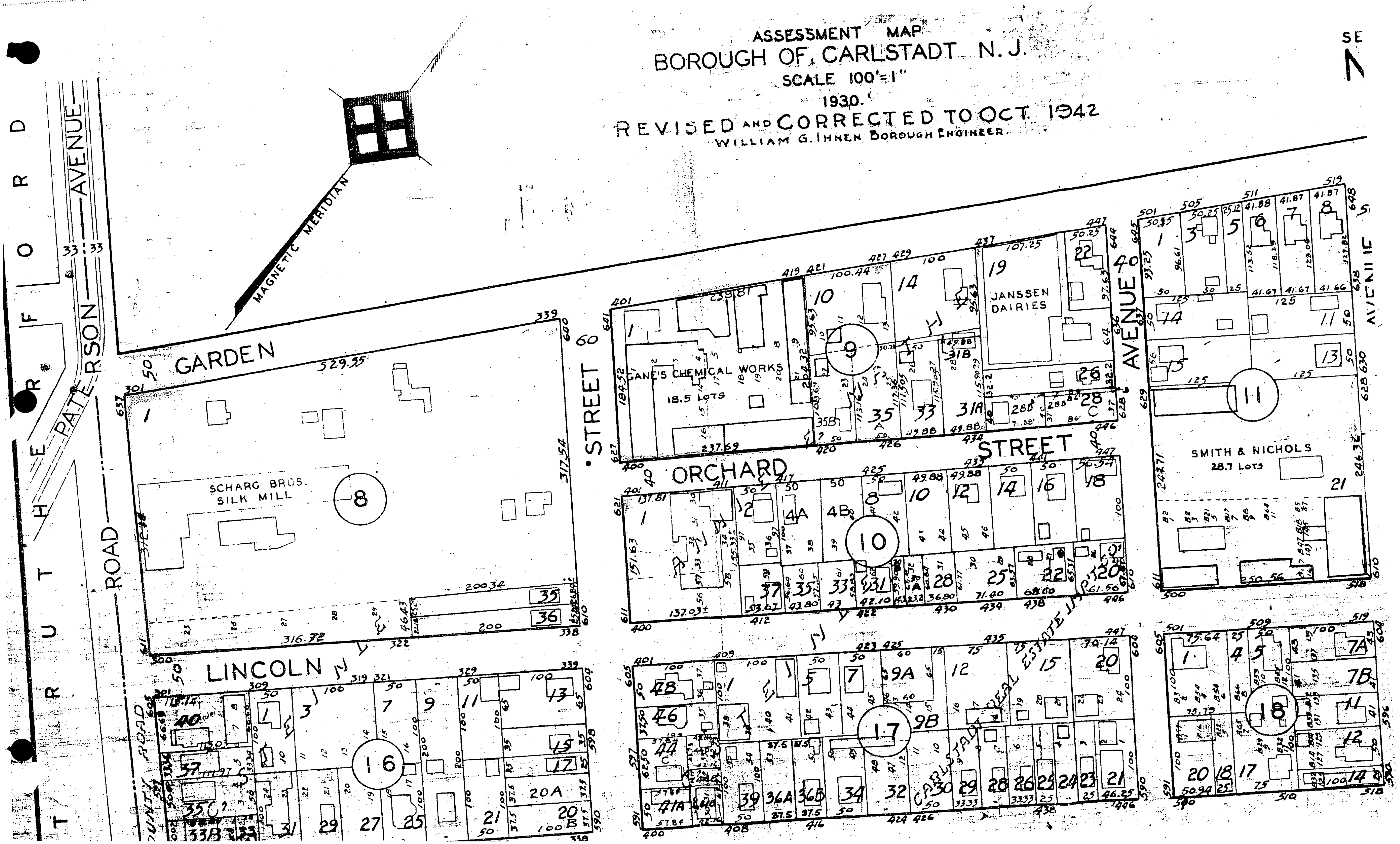
Note:
[4] Portion = It is unclear following conducting two ASTM Historical Chain-of-Title searches and reviewing the City of Carlstadt records as to the location of Lots 1A and 1B. Therefore, operations have been designated the same for all three lots.
[5]Portion = Township of Carlstadt title records do not indicate what portion of the lot was purchases and sold.

GEE "
- STOP

APPENDIX A-2

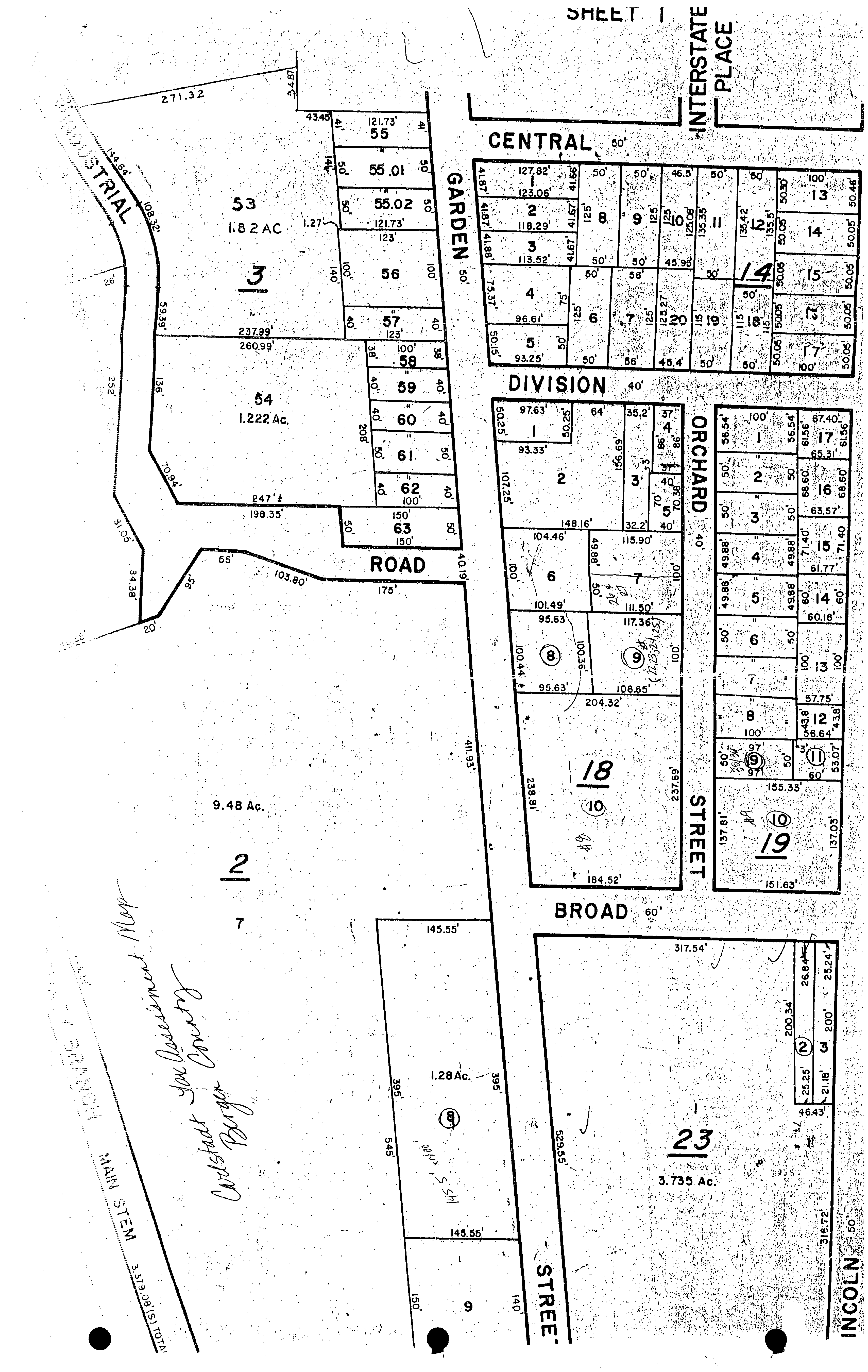
TAX ASSESSMENT MAPS

1942 TAX ASSESSMENT MAP



ASSESSMENT MAP
BOROUGH OF CARLSTADT N. J.
SCALE 100'=1"
1930.
REVISED AND CORRECTED TO OCT. 1942
WILLIAM G. IHNEN BOROUGH ENGINEER.
SE
MAGNETIC MERIDIAN
PATERSON AVENUE
RUTHERFORD
GARDEN
STREET
ORCHARD
LINCOLN
AVENUE
ROAD
SCHARG BROS. SILK MILL
GANE'S CHEMICAL WORKS
18.5 LOTS
JANSSEN DAIRIES
SMITH & NICHOLS
28.7 LOTS
CARLSTADT REAL ESTATE

CURRENT TAX ASSESSMENT MAP



SHEET 1
INTERSTATE PLACE
CENTRAL
GARDEN
DIVISION
ORCHARD
STREET
ROAD
BROAD
STREE
INCOLN
INDUSTRIAL
BRANCH
MAIN STEM
3,379.08'(S) TOTAL
53
1.82 AC
3
54
1.222 Ac.
9.48 Ac.
2
1.28 Ac.
14
18
19
23
3.735 Ac.
Carlstadt Tax Assessment Map
Bergen County

APPENDIX A-3

HISTORICAL CHAIN OF TITLE REPORTS

DECEMBER 21, 1999

HISTORICAL CHAIN OF TITLE REPORTS

Real Estate Research
& Information

2055 East Rio Salado Parkway
Tempe, Arizona 85281
(480) 967-6752
(480) 966-9422 Fax
www.netronline.com

HISTORICAL CHAIN OF TITLE REPORT

GANES CHEMICAL
630 BROAD STREET
CARLSTADT, NEW JERSEY

Submitted to:

ENVIRONMENTAL DATA RESOURCES, INC.
C/O
MCLAREN / HART, INC.
470 Norristown Road
Blue Bell, Pennsylvania 19422
610-567-1500

Attention: Lara Herzig

Project No. N99-2128R

December 21, 1999

Nationwide Environmental Title Research hereby submits the following ASTM historical chain-of-title to the land described below, subject to the leases/miscellaneous shown in Section 2. Title to the estate or interest covered by this report appears to be vested in:

GANES CHEMICAL, INC.

The following is the current property legal description:

All those certain pieces or parcels of land being further bound and described in the attached vesting deeds, lying and situate in the Borough of Carlstadt, the County of Bergen, and State of New Jersey.

1. HISTORICAL CHAIN OF TITLE

CHAIN ONE: Conveying Lot 2, Block 23

1. Mary Fill and husband acquired title to the property prior to 1900.

2. DEED:
   RECORDED: 09-28-1931
   GRANTOR: Mary Fill, widow
   GRANTEE: Arthur E. Fill & Catherine Fill
   INSTRUMENT: Bk 1801, Pg 6

3. WARRANTY DEED:
   RECORDED: 02-24-1955
   GRANTOR: Mary Fill, et vir
   GRANTEE: Catherine Fill
   INSTRUMENT: Bk 3626, Pg 346

4. WARRANTY DEED:
   RECORDED: 06-27-1967
   GRANTOR: Catherine Fill
   GRANTEE: Louis Van Hentenryck, et ux
   INSTRUMENT: Bk 5056, Pg 202

5. BARGAIN & SALE DEED:
   RECORDED: 09-18-1972
   GRANTOR: Louis Van Hentenryck
   GRANTEE: Ann M. Van Hentenryck
   INSTRUMENT: Bk 5694, Pg 207

6. BARGAIN & SALE DEED:
   RECORDED: 08-07-1978
   GRANTOR: Ann Marie Van Hentenryck, unmarried
   GRANTEE: John J. Eckert & Joanne Eckert, his wife
   INSTRUMENT: Bk 6417, Pg 454

7. DEED:
   RECORDED: 10-13-1998
   GRANTOR: Joanne L. Eckert, widow
   GRANTEE: Ganes Chemicals, Inc.
   INSTRUMENT: Bk 8109, Pg 591

CHAIN TWO: Conveying Lot 8, Block 18

8. Cono Scaffidi Saggio and wife acquired title to the property prior to 1900.

9. DEED:

RECORDED:	09-15-1936
GRANTOR:	Cono Scaffidi Saggio, et ux
GRANTEE:	Maria Miragliotta, et vir
INSTRUMENT:	Bk 2031, Pg 87

10. DEED:

RECORDED:	05-29-1946
GRANTOR:	Maria Miragliotta, et vir
GRANTEE:	Catherine Herold
INSTRUMENT:	Bk 2641, Pg 489

11. BARGAIN & SALE DEED:

RECORDED:	02-03-1981
GRANTOR:	Catherine Herold, widow
GRANTEE:	Ganes Chemicals, Inc.
INSTRUMENT:	Bk 6614, Pg 511

CHAIN THREE: Conveying Lot 11, Block 19

12. Henry Hammond & wife acquired title to the property prior to 1900.

12. WARRANTY DEED:

RECORDED:	11-14-1945
GRANTOR:	Henry Hammond, et ux
GRANTEE:	Kathleen Kuenzle, et vir
INSTRUMENT:	Bk 2576, Pg 375

13. WARRANTY DEED:

RECORDED:	01-21-1952
GRANTOR:	Kathleen Kuenzle, et vir
GRANTEE:	Leonard Pati, et ux
INSTRUMENT:	Bk 3287, Pg 214

14. BARGAIN & SALE DEED:

RECORDED:	10-01-1981
GRANTOR:	Leonard Patti, et ux
GRANTEE:	Anthony Rinaldi, et ux
INSTRUMENT:	Bk 6655, Pg 227

15. BARGAIN & SALE DEED:

RECORDED:	02-04-1988
GRANTOR:	Anthony Rinaldi & Sharon Rinaldi
GRANTEE:	Sharon Rinaldi
INSTRUMENT:	Bk 7180, Pg 442

16. DEED:

RECORDED:	11-08-1989
GRANTOR:	Sharon Rinaldi
GRANTEE:	Ganes Chemicals, Inc.
INSTRUMENT:	Bk 7330, Pg 782

CHAIN FOUR: Conveying Lot 9, Block 18

17. Marie Rasmussen and husband acquired title to the property prior to 1900.

18. WARRANTY DEED:

RECORDED:	10-05-1918
GRANTOR:	Marie Rasmussen, widow
GRANTEE:	Antonio Antonicelli, et ux
INSTRUMENT:	Bk 996, Pg 490

19. WARRANTY DEED:

RECORDED:	08-13-1959
GRANTOR:	Antonio Antonicelli, et ux
GRANTEE:	Angelo A. Glionna, et ux
INSTRUMENT:	Bk 4058, Pg 115

20. WARRANTY DEED:

RECORDED:	10-13-1960
GRANTOR:	Antonio Antonicelli & Maria Antonicelli, his wife
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 4175, Pg 299
COMMENTS:	Conveying lots previously known as Lots 22 & 23

21. WARRANTY DEED:

RECORDED:	10-13-1960
GRANTOR:	Angelo A. Glionna & Claire Glionna, his wife
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 4175, Pg 302
COMMENTS:	Conveying lots previously known as Lots 24 & 25

CHAIN FIVE: Conveying Lot 7, Block 18

22. Clarence E. Mathe and wife acquired title to the property prior to 1900.

23. DEED:

RECORDED:	08-03-1939
GRANTOR:	Clarence E. Mathe, et ux
GRANTEE:	Nicholas Micci, et ux
INSTRUMENT:	Bk 2173, Pg 233

24. WARRANTY DEED:

RECORDED:	10-25-1966
GRANTOR:	Nicholas Micci & Margaret Micci, his wife
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 4983, Pg 406
COMMENTS:	Conveying two tracts of land; Tract 1 being the Westerly portion and Tract 2 being the Easterly portion of the lot.

CHAIN SIX: Conveying Lot 9, Block 19

25. Geovanni Fillipelli and wife acquired title to the property prior to 1900.

26. DEED:

RECORDED:	05-23-1927
GRANTOR:	Geovanni Fillipelli, et ux
GRANTEE:	John Romanelli, et ux
INSTRUMENT:	Bk 1498, Pg 323

27. WARRANTY DEED:

RECORDED:	07-03-1967
GRANTOR:	John Romanelli & Elvira Romanelli, his wife
GRANTEE:	Gane's Chemical Works, Inc.
INSTRUMENT:	Bk 5060, Pg 29

CHAIN SEVEN: Conveying Lot 8, Block 2

28. Michael Ollert acquired title to the property prior to 1900.

29. DEED:

RECORDED:	06-26-1933
GRANTOR:	Michael Ollert
GRANTEE:	William T. Muehling, et ux
INSTRUMENT:	Bk 1890, Pg 67

30. WARRANTY DEED:

RECORDED:	03-10-1947
GRANTOR:	William T. Muehling & Lillian G. Muehling, his wife
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 2735, Pg 415

CHAIN EIGHT: Conveying Lot 10, Block 18

31. Albert Bolle & Marie T. Bolle acquired title to a portion of the property prior to 1900.

32. H. Charles Euler and wife acquired title to a portion of the property prior to 1900.

33. William Mathe & Annie E. Mathe acquired title to a portion of the property prior to 1900.

34. DEED:

RECORDED:	10-10-1894
GRANTOR:	Albert Bolle & Marie T. Bolle
GRANTEE:	The Trubek Chemical Works, Inc.
INSTRUMENT:	Bk 590, Pg 164

35. DEED:

RECORDED:	01-16-1909
GRANTOR:	H. Charles Euler, et ux
GRANTEE:	The Trubek Chemical Works, Inc.
INSTRUMENT:	Bk 715, Pg 544

36. WARRANTY DEED:

RECORDED:	04-11-1912
GRANTOR:	William Mathe & Annie E. Mathe, his wife
GRANTEE:	Franco-American Chemical Works
INSTRUMENT:	Bk 812, Pg 180

37. WARRANTY DEED:

RECORDED:	07-24-1934
GRANTOR:	Franco-American Chemical Works
GRANTEE:	Gane's Chemical Works, Inc.
INSTRUMENT:	Bk 1932, Pg 481
COMMENTS:	Name of The Trubek Chemical Works changed to Franco-American Chemical Works, filed on 03-11-1909; conveyed property from both companies.

CHAIN NINE: Conveying Lot 10, Block 19

38. Moses Trubek assembled and acquired title to the property prior to 1900.

38. DEED:

RECORDED:	08-22-1940
GRANTOR:	Josephine Trubek, Leo Trubek, and Max Trubek, as Executors under the Last Will & Testament of Moses Trubek, deceased; and Josephine Trubek, Leo Trubek, and Max Trubek, and Rutherford National Bank of Rutherford, New Jersey, as Trustees under Last Will & Testament of Moses Trubek, deceased
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 2234, Pg 184

2. LEASES AND MISCELLANEOUS

1. ACCESS & EASEMENT AGREEMENT:

RECORDED:	10-05-1993
GRANTOR:	Ganes Chemicals, Inc., a New Jersey corporation
GRANTEE:	The Borough of Carlstadt, a municipal corporation
INSTRUMENT:	Bk 7642, Pg 515
COMMENTS:	The document contains a legal description for Lot 1, Block 23; the Grantor herein is stated to be the owner of said property.

2. No leases or environmental liens were found of record.

3. LIMITATION

This report was prepared for the use of Environmental Data Resources, Inc., and McLaren/Hart, Inc., exclusively. This report is neither a guarantee of title, a commitment to insure, or a policy of title insurance. Nationwide Environmental Title Research does not guarantee nor include any warranty of any kind whether expressed or implied, about the validity of all information included in this report since this information is retrieved as it is recorded from the various agencies that make it available. The total liability is limited to the fee paid for this report.

Kathleen A. Lehman

148389

RECORDED-BERGEN COUNTY
93 OCT -5 PM 12:31

Consideration $
Realty Transfer Fee
Recording Fee
By
Total

Prepared by ______________________
John L. Molinelli, Esq.
An Attorney at Law of New Jersey

ACCESS AND EASEMENT AGREEMENT

MADE this 27th day of September, 1993,

By and Between:

GANES CHEMICALS, INC., a New Jersey Corporation, located at 630 Broad Street, Carlstadt, New Jersey, (hereinafter referred to as "Ganes" or "Grantor");

AND

THE BOROUGH OF CARLSTADT, a Municipal Corporation of the State of New Jersey, located at 500 Madison Street, Carlstadt, New Jersey, (hereinafter referred to as "Borough" or "Grantee");

WITNESSETH:

WHEREAS, Ganes is the owner of lands and premises located at the corner of Garden Street and Hoboken Road, Carlstadt, Bergen County and known as Block 23, Lot 1.

BEGINNING at a point on the southeasterly lines of Garden Street, said point being distant 33.17′ northeasterly from the corner formed by the intersection of the northeasterly line of Hoboken Road, and the said Line of Garden Street, running thence;

1) N 38° 10′ E 5.00′ along the said line of Garden Street, thence;
2) S 4° 37′ 30′′ E 41.30 to a point 10′ North of Hoboken Road, thence;
3) N 47° 25′ W 5.00′, thence;
4) Northerly 37.34′ along a circular area curving to the right with a central angle of 85° 35′, and a radius of 25.00′ to the point or place of **BEGINNING**.

NOW, THEREFORE, for and in consideration of the mutual promises and covenants hereinafter contained, the parties hereto agree as follows:

1. The purpose of this easement conveyed to Grantee is for the placement, maintenance, and use of a "Welcome to Carlstadt" sign by the Carlstadt Woman's Club. The sign is to be erected at the cost and expense of the Carlstadt Woman's Club on the property herein described.

2. Grantee shall ensure that the sign is in compliance with all governmental approvals and regulations.

3. Grantor shall not be held liable for any injury sustained by persons entering on Grantor's property for purposes of sign erection or maintenance and the like as stated in the agreement attached.

4. The easement described herein may be extinguished at any time by Grantor, its successors, or assigns if at any time Grantor should need this area for any purpose or the property is subsequently conveyed.

5. This Agreement may not be modified except by further written agreement executed by all the parties.

6. This Agreement and the performance thereof shall be governed, interpreted, construed and regulated by the laws of the State of New Jersey.

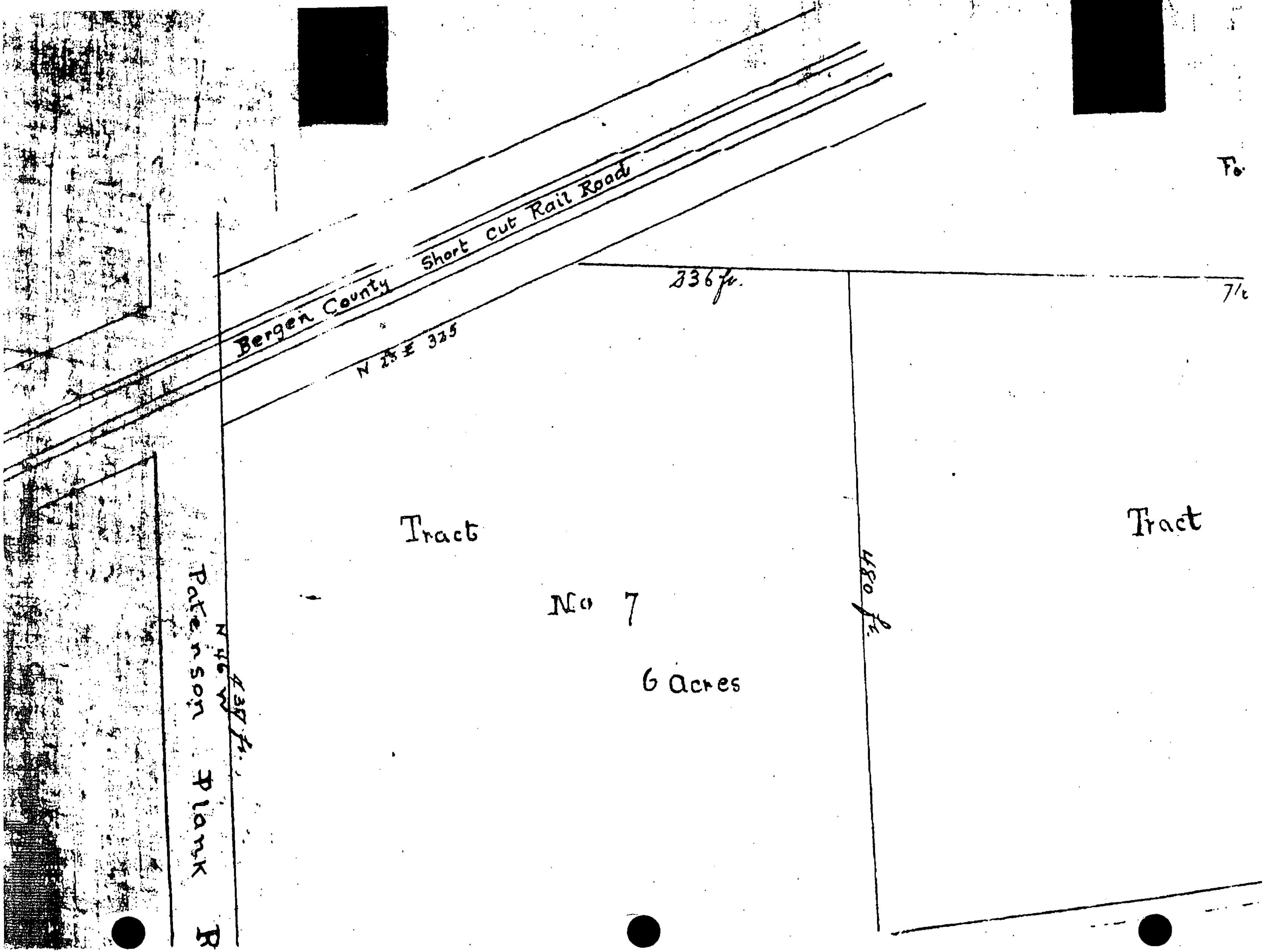
7. This Agreement sets forth all of the provisions, agreements, conditions and understandings between the parties hereto relative to the subject matter hereof, and there are no promises, agreements, conditions or understandings, either

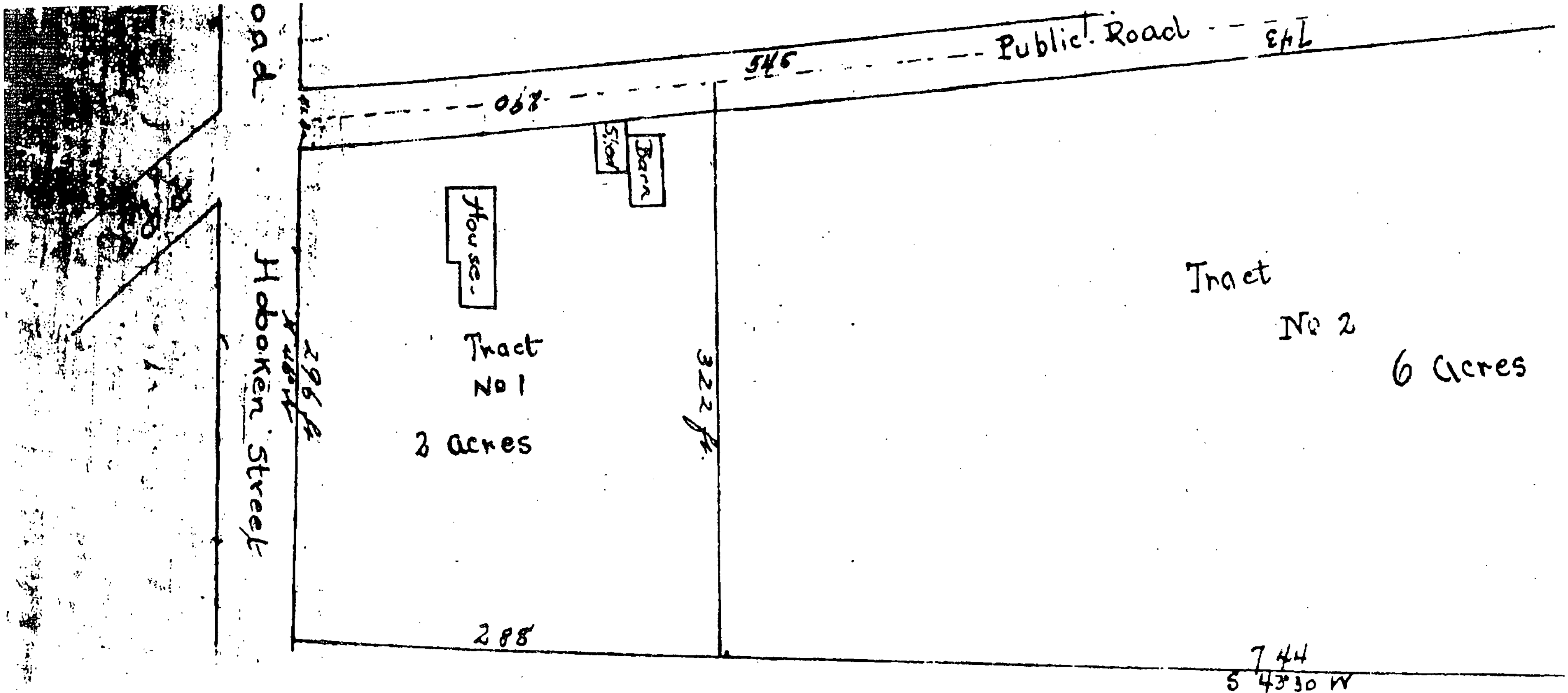
written or oral, expressed or implied, between them other than as set forth herein.

8. This Agreement shall be recorded in the Bergen County Clerk's Office.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals.

ATTEST:	**BOROUGH OF CARLSTADT**
	By ______________
	Dominick Presto, Mayor
Claire Foy	
Claire Foy, Borough Clerk	
ATTEST:	**GANES CHEMICAL, INC.**
Jeryl D. Rubin	By ______________
Jeryl D. Rubin, Asst. Secretary	Emil Gunthardt, President


Bergen County Short cut Rail Road
336 ft.
Tract
No 7
6 Acres
480 ft.
Tract
Paterson Plank R



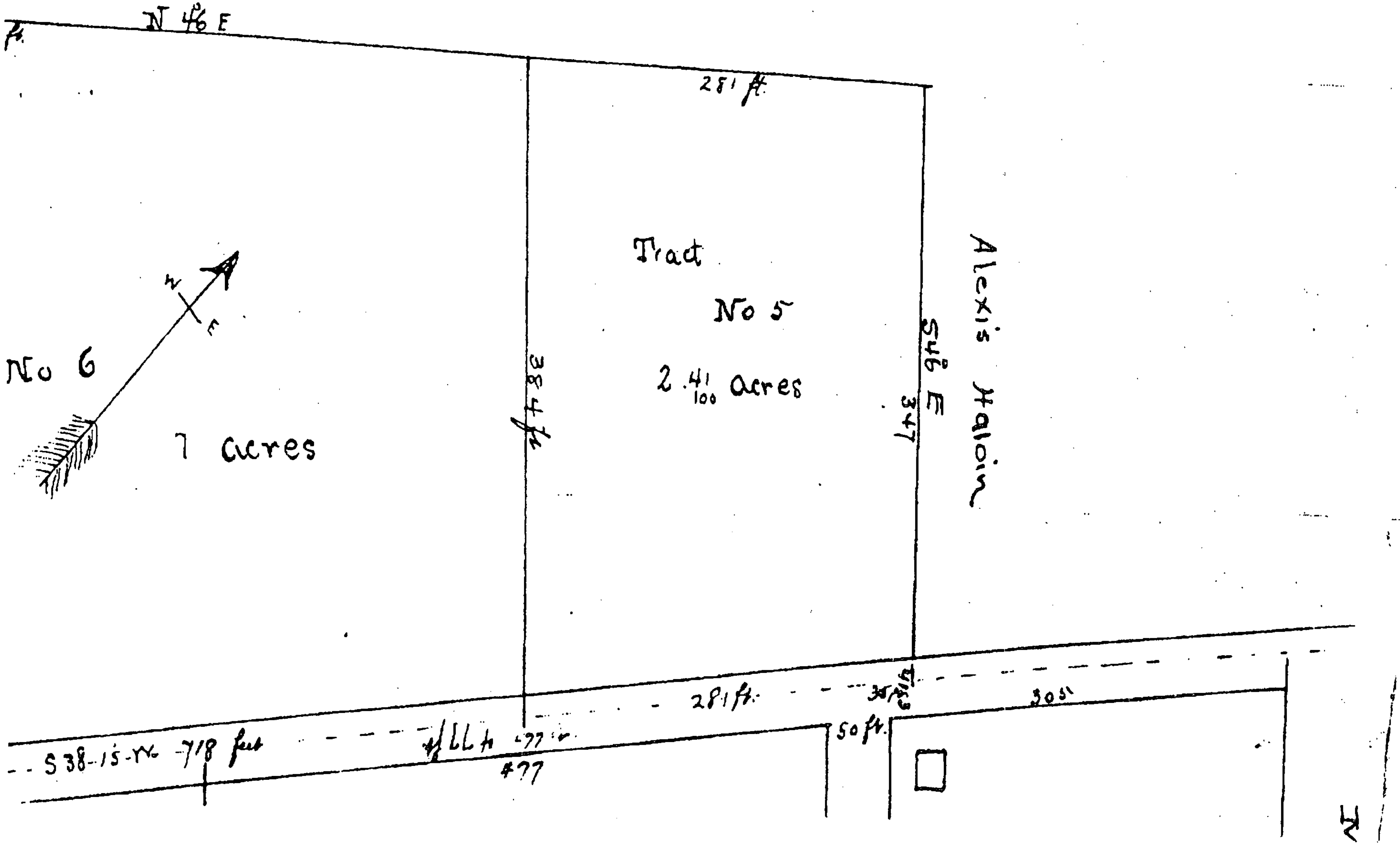
Map of Property of the Heirs
of William Mathe Decd

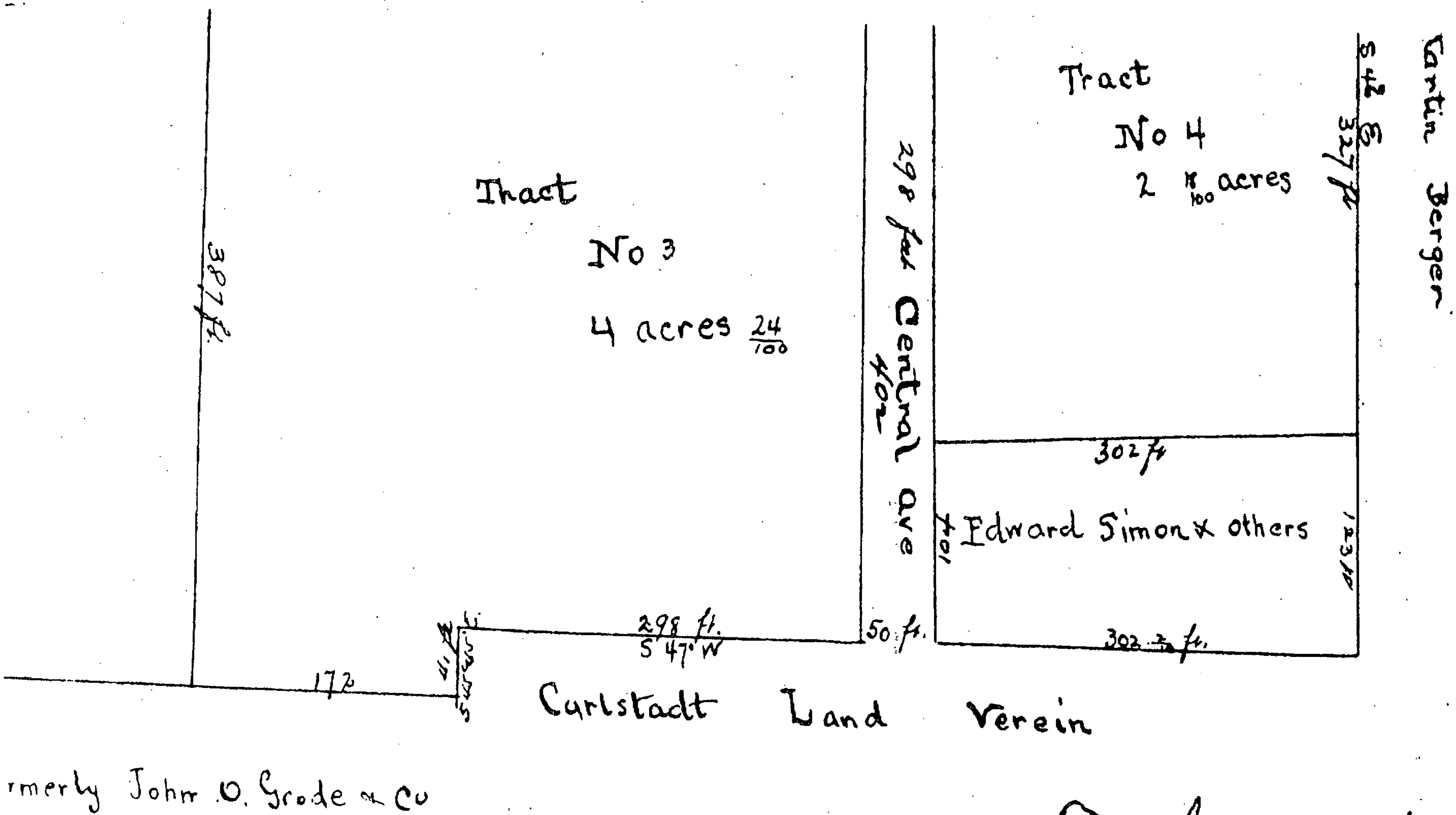
Dated Jany 2d 1890

Scale of Map 10 ft to 100 feet

Constance Mathe
[illegible]
...ar Mathe
William Mathe
Theodore Mathe

merly Henry Buggllen





Filed January 6th A D 18

#438

Consid: 180000.00 R
Rlty: 675.00 Cnty: 180.00
Fees: 22.00 State: 450.00
Tot: 697.00 MPNRF: 45.00

Prepared by:

DENNIS C. RITCHIE, ESQ.

DEED

This Deed is made on SEPTEMBER 21, 1998

BETWEEN

JOANNE L. ECKERT, widowed

whose address is: 320 Marsan Drive, Carlstadt, New Jersey, 07072,

referred to as the Grantor

AND

GANES CHEMICAL, INC.

whose post office address is: 630 Broad Street, Carlstadt, NJ 07072. referred to as the Grantee.

RECORDED-BERGEN COUNTY
98 OCT 13 PM 2:48

The words "Grantor" and "Grantee" shall mean all Grantors and all Grantees listed above.

Transfer of Ownership. The Grantor grants and conveys (transfers ownership of) the property described below to the Grantee. This transfer is made for the sum of $180,000.00 (One Hundred Eighty Thousand Dollars and 00/100).

The Grantor acknowledges receipt of this money.

Tax Map Reference. (N.J.S.A. 46:15-1.1) Municipality of Carlstadt
Block No.: 23 Lot No.: 2 Account No.:

( ) No property tax identification number is available on the date of this Deed. (Check if applicable).

Kathleen A. Donovan
COUNTY CLERK
159281

Property. The property consists of the land and all the buildings and structures on the land in the Borough of Carlstadt County of Bergen and State of New Jersey. The legal description is:

BEGINNING at a point on the southerly line of Broad Street, distant 300.54 feet westerly from the intersection of the westerly line of Union Street with the southerly line of Broad Street and running; thence

(1) southerly along the line of land of Herman Kreiling 200.00 feet to a point distant 296.18 feet westerly from the westerly line of Union Street; thence

(2) easterly and parallel with Broad Street 25.00 feet; thence

(3) northerly and parallel with the first course 200.00 feet to the southerly line of Broad Street; thence

(4) westerly along the southerly line of Broad Street 25.00 feet to the point of place of BEGINNING.

Being the same premises conveyed by Deed from Ann Marie Van Hentenryck, unmarried, dated August 4, 1978 to John J. Eckert and Joanne L. Eckert, his wife, and recorded August 7, 1978 in Deed Book 6417 at Page 454 at the Bergen County Register's Office. The said John J. Eckert died on December 20, 1984 and Joanne L. Eckert took title as surviving tenant by the entirety.

over

100—0600 - BARGAIN AND SALE (COVENANT AGAINST GRANTOR) IND. TO IND. OR CORP.   D C R V · T   COPYRIGHT© 1965 BY ALL-STATE LEGAL SUPPLY CO. 269 SHEFFIELD STREET, MOUNTAINSIDE, N.J. 07092

Consideration $ 84,000.00
Realty Transfer Fee 84.00
Recording Fee 15.00
Total $ 99.00
By 76

This Deed, *made the* 30th *day of* January 1981,

Between

CATHERINE HEROLD, Widow

residing at 425 Garden Street *in the* Borough *of* Carlstadt *in the County of* Bergen *and State of* New Jersey *herein designated as the Grantors,*

And

GANES CHEMICALS, INC.

residing or located at 1114 Avenue of the Americas *in the* City *of* New York *in the County of* New York *and State of* New York *herein designated as the Grantees:*

Witnesseth, *that the Grantors, for and in consideration of* EIGHTY FOUR THOUSAND and 00/100 ($84,000.00)-----------------------------------DOLLARS

lawful money of the United States of America, to the Grantors in hand well and truly paid by the Grantees, at or before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, and the Grantors being therewith fully satisfied, do by these presents grant, bargain, sell and convey unto the Grantees forever,

All that *tract or parcel of land and premises, situate, lying and being in the* Borough *of* Carlstadt *in the County of* Bergen *and State of New Jersey, more particularly described herein.*

Tax Map Reference
(NJS 46:15-2.1) Municipality of: Carlstadt *Lot No.* 8 *Account No.*
Block No. 18
☐ *No property tax identification number is available on date of this deed. (Check box if applicable.)*

BEGINNING at a point in the easterly line of Garden Street, 257.50 feet southerly along the same from its intersection with the southerly line of division street and running;

(1) South 46° 00' East 95.625 feet; thence
(2) South 38° 15' West parallel with Garden Street, 100 feet; thence
(3) North 46° 00' West 95.62 feet to the easterly line of Garden Street; thence
(4) North 38° 15' East along the easterly line of Garden Street to the place of BEGINNING.

Description prepared from survey by Gerald Cassetta, L.S. dated December 18, 1980.

Commonly known as 425 Garden Street, Carlstadt, New Jersey. Also known as Block 18 Lot 8 on tax map of the above municipality.

BEING the same premises conveyed to Catherine Herold, by Deed dated May 29, 1946, and recorded May 29, 1946, in Book 2641 at Page 489, in the Bergen County Clerk's Office.

SUBJECT to easements, restrictions, agreement and covenants, and any rule, regulation, law, ordinance of any governmental body having jurisdiction over the same and such state of facts as an accurate survey may disclose.

RECEIVED
FEB 3 11 40 AM '81
[signature]
BERGEN COUNTY CLERK

BOOK 6614 PAGE 511

JACK A. TRAINA

DEED

This Deed is made on October 16, 1989

BETWEEN

SHARON RINALDI

whose address is 280 Tenth Street
Wood-Ridge, N. J.

referred to as Grantor.

AND

GANES CHEMICALS, INC.

whose address is 630 Broad Street,
Carlstadt, N. J.

referred to as the Grantee.

The words "Grantor" and "Grantee" shall mean all Grantors and all Grantees listed above.

Transfer of Ownership. The Grantor grants and conveys (transfers ownership of) the property described below to the Grantee. This transfer is made for the sum of TWO HUNDRED FORTY THOUSAND and 00/100 DOLLARS ($240,000.00). The Grantor acknowledges receipt of this money.

Tax Map Reference. (N.J.S.A.46:15-2.1)
Municipality of Carlstadt.
Block No. 19 Lot No. 11 Account No.
No property tax identification number is available on the date of this deed. (Check box if applicable.)

Property. This property consists of the land and all the buildings and structures on the land in the Borough of Carlstadt, County of Bergen and State of New Jersey. The legal description is:

SEE ATTACHED SCHEDULE A

117549

89 NOV -8 PM 3:36

BK 1330 PG 182

SCHEDULE A

BEGINNING at a point in the northerly line of Lincoln Street distant 138.10 feet northeasterly from the point of intersection of the northerly line of Lincoln Street with the easterly line of Broad Street and from thence running (1) North 24 degrees 10 minutes West 55.35 feet to a point; thence (2) South 64 degrees 33 minutes 13 seconds West 0.04 feet to a point; thence (3) North 24 degrees 19 minutes 58 seconds West 3.24 feet to a point; thence (4) North 64 degrees 27 minutes East 50.00 feet to a point; thence (5) South 24 degrees 19 minutes 58 seconds East 3.33 feet to a point; thence (6) North 64 degrees 33 minutes 13 seconds East 2.05 feet to a point; thence (7) South 24 degrees 10 minutes East 56.65 feet to a point in the northerly line of Lincoln Street; thence (8) Along the same, South 66 degrees 00 minutes West 52.00 feet to the point or place of BEGINNING.

"In compliance with Chapter 157, Laws of 1977, premises herein are Lot 11 in Block 19 on the Tax Map of the above municipality."

Being the same premises conveyed to Grantor herein under deed from Anthony Rinaldi and Sharon Rinaldi, his wife, dated August 12, 1987, recorded February 4, 1988 in Deed book 7180 page 442. (This deed also releases the curtesy rights of Anthony Rinaldi).

This Indenture,

Made the day of , in the year One Thousand Nine Hundred and SIXTY

Between ANTONIO ANTONICELLI and MARIA ANTONICELLI, his wife

of the Borough of Carlstadt in the County of Bergen and State of New Jersey party of the first part, hereinafter known as the grantor s :

And GANE'S CHEMICAL WORKS, INC., a New York Corporation, authorized to do business in the State of New Jersey, with an office in

the Borough of Carlstadt in the County of Bergen and State of New Jersey party of the second part, hereinafter known as the grantee :

Witnesseth, That in consideration of One ($1.00) Dollar and other good and valuable consideration---------

the said grantor s do grant, bargain, sell and convey, unto the said grantee, its successors and assigns

All that certain lot, tract or parcel of land and premises, hereinafter particularly described, situate, lying and being in the Borough of Carlstadt in the County of Bergen and State of New Jersey:

BEING known and distinguished on a certain map entitled "Map of Property of Annie E. Mathe, Carlstadt, N.J., November, 1898" which map is filed in the Office of the Clerk of Bergen County, N.J. and numbered as 438 as lots number twenty-two (22) and twenty-three (23) on the westerly side of Orchard Street, and is further described as follows:

BEGINNING at a point on the westerly side of said Orchard Street 237.69 feet northerly from the northerly side of Broad Street and running thence (1) Northerly and along the westerly side of Orchard Street 50 feet to the dividing line between Lots 23 and 24, as shown on the above entitled map; thence (2) westerly and along said dividing line 113.16 feet, more or less, to the westerly line of said Lot 23; thence (3) southerly and along the westerly line of said Lots 22 and 23, 50 feet, more or less, to the southerly line of said Lot 22; thence (4) easterly and along the southerly line of said Lot 22, 106.89 feet to the point or place of Beginning.

Being known by the street number 418 Orchard Street, Carlstadt, New Jersey.

Being part of the same lands and premises conveyed to Antonio Antonicelli by deed dated October 1, 1918 and recorded on October 5, 1918 in Book 996, page 490.

RECEIVED

OCT 13 3 29 PM '60

RECEIVED

OCT 13 3 29 PM '60

This Indenture,

Made the Eleventh *day of* October, *in the year of our Lord* *One Thousand Nine Hundred and* Sixty.

Between

ANGELO A. GLIONNA and CLAIRE GLIONNA, his wife,

of *the* Borough *of* Rutherford, *in the County of* Bergen *and State of* New Jersey, *party of the first part;*

And

GANE'S CHEMICAL WORKS, INC., a New York corporation authorized to do business in the State of New Jersey, with an office in

the Borough *of* Carlstadt, *in the County of* Bergen *and State of* New Jersey, *party of the second part;*

Witnesseth, *That the said party of the first part, for and in consideration of* One ($1.00) Dollar and other good and valuable consideration, *lawful money of the United States of America, to* [illegible] *in hand well and truly paid by the said party of the second part, at or before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, and the said party of the first part being therewith fully satisfied, contented and paid, ha* ve *given, granted, bargained, sold, aliened, released, enfeoffed, conveyed and confirmed, and by these presents do give, grant, bargain, sell, alien, release, enfeoff, convey and confirm unto the said party of the second part, and to* its successors *and assigns, forever.*

All that certain *tract or parcel of land and premises, hereinafter particularly described, situate, lying and being in the* Borough *of* Carlstadt, *in the County of* Bergen *and State of* New Jersey:

BEING known and distinguished as Lots Numbers 24 and 25 on a certain map entitled, "Map of Property of [illegible], Carlstadt, N. J. Nov. [illegible]", which said map was filed in the Office of the Clerk of Bergen County as Map No. [illegible] and [illegible] more particularly described as follows:

BEGINNING at a point on the westerly side of Orchard Street [illegible] feet Northeasterly from the Northerly side of Broad Street, which said beginning point is also the [illegible] of Lots 24 and 25 on the map aforesaid, and running thence (1) [illegible] along the Westerly side of Orchard Street [illegible] to the dividing line between lots 25 and 26 on the aforesaid map; thence (2) Westerly ~~[illegible] degrees [illegible] minutes West~~ and along the dividing line between lots [illegible] and [illegible] on the aforesaid map 117.35 feet, more or less, to the [illegible] line of lot [illegible]; thence (3) Southerly ~~South [illegible]~~ [illegible] minutes, [illegible] seconds West and along the westerly line of said lots [illegible] and [illegible], [illegible] feet, more or less, to a point in the dividing line between lots 23 and 24 on the aforesaid map; thence (4) Easterly ~~South [illegible] degrees~~ [illegible] minutes East and along the dividing line between lots 23 and 24 on said map 115.36 feet, more or less, to the Westerly side of Orchard Street and the point or place of Beginning.

BEING the same premises conveyed to the said Angelo A. Glionna by Antonio Antonicelli and Maria Antonicelli, his wife, by Deed dated August 11, 1959 and recorded in the Clerk's Office of Bergen County on August 13, 1959 in Book 4053 of Deeds, at page 11[illegible].

[illegible] REVENUE STAMPS

BOOK 4175 PAGE 302

This Indenture,

Made the 24th *day of* October , *in the year One Thousand Nine Hundred and* Sixty-Six

Between NICHOLAS MICCI and MARGARET MICCI, his wife residing at 436 Orchard Street

of *the* Borough *of* Carlstadt , *in the County of* Bergen *and State of* New Jersey *party of the first part, hereinafter known as the grantor* s ;

And GANE'S CHEMICAL WORKS, INC., a New York Corporation, having an office at 611 Broad Street

of *the* Borough *of* Carlstadt *in the County of* Bergen *and State of* New Jersey *party of the second part, hereinafter known as the grantee* :

Witnesseth, *That in consideration of* One Dollar and other good and valuable consideration

the said grantor s *do grant, bargain, sell and convey, unto the said grantee* its successors *and assigns*

All that *tract* s *or parcel* s *of land and premises, hereinafter particularly described, situate, lying and being in the* Borough *of* Carlstadt *in the County of* Bergen *and State of* New Jersey

TRACT 1

Beginning at a point on the Northwesterly side of Orchard Street, distant Three Hundred and Thirty-seven and Sixty-nine Hundredths (337.69) Feet Northeasterly from the intersection of the said Northwesterly side of Orchard Street with the Northeasterly side of Broad Street as shown on map hereinafter referred to and running, thence (1) Northwesterly at right angles with Orchard Street, One Hundred, Eleven and Five Hundred and Five Thousandths (111.505) Feet to a point, thence (2) Northeasterly parallel with Garden Street, Fifty (50) Feet, thence (3) Southeasterly parallel with the first course, One Hundred and Fifteen and Nine Hundred and Five Thousandths (115.905) Feet to the said Northwesterly side of Orchard Street, thence (4) Southeasterly along the same Forty-Nine and Twenty-eight Hundredths (49.28) Feet to the point or place of beginning.

Being further known and designated as part of Lots 26 and 27 as shown on "Map of Property of Annie E. Mathe, Carlstadt, New Jersey, November, 1898", said map being on file in the Clerk's Office of the County of Bergen.

Being the same premises conveyed to the grantors by deed from Clarence E. Mathe and Rose Mathe, his wife, dated August 1, 1939, and recorded August 3, 1939 in the Bergen County Clerk's Office in Book 2173 Page 233 &c.

BEGINNING at a point on the northwesterly side of Orchard Street, distant three hundred eight-seven and fifty-seven hundredths (387.57) feet northeasterly from the intersection of the said northwesterly side of Orchard Street with the northeasterly side of Broad Street as shown on map hereinafter referred to and running thence (1) northwesterly, at right angles or nearly so with Orchard Street, one hundred fifteen and ninety hundredths (115.90) feet to a point; thence (2) northeasterly, parallel with Orchard Street, forty-nine and eighty-eight hundredths (49.88) feet; thence (3) southeasterly, parallel with the first course, one hundred fifteen and ninety hundredths (115.90) feet to the said northwesterly side of Orchard Street; and thence (4) southwesterly, along the same, forty-nine and eighty-eight hundredths (49.88) feet to the point or place of BEGINNING.

Being further known and designated as the front portions of lots numbers 28 and 29 as shown on "Map of Property of Annie E. Mathe, Carlstadt, New Jersey, November 1898" said map being on file in the Clerk's Office of the County of Bergen.

Being the same premises conveyed to the grantors by deed from Jerome Giuseffi and Herbert Krug, Executors of the Last Will and Testament of Annie E. Mathe, dated May 18, 1943, and recorded June 25, 1943 in the Bergen County Clerk's Office in Book 2390 Page 360 &c.

SUBJECT TO covenants, restrictions and easements of record, if any.

RECEIVED
1966 OCT 25 AM 10:57
BERGEN COUNTY CLERK

JOHN ROMANELLI and ELVIRA ROMANELLI, his wife,

residing ~~at~~ 411 Orchard Street
in the Borough of Carlstadt in the County of
Bergen and State of New Jersey herein designated as the Grantor s,
and

OANE'S CHEMICAL WORKS, INC.

~~residing~~ located at 611 Broad Street
in the Borough of Carlstadt in the County of
Bergen and State of New Jersey herein designated as the Grantee ;

Witnesseth: That in consideration of ONE ($1.00) DOLLAR and other good and valuable considerations,
the Grantor s do grant and convey, unto the Grantee

All that tract or parcel of land and premises, situate, lying and being in the Borough of Carlstadt in the County of Bergen and State of New Jersey more particularly described as follows:

BEING known and distinguished on a certain map entitled "Map of property of Annie E. Mathe, Carlstadt, N.J." said map is filed in the office of the Clerk of Bergen County, New Jersey, as part of lots numbers thirty-five (35) and thirty-six (36) on the easterly side of Orchard Street, and more fully described as follows:

BEGINNING at a point on the easterly side of Orchard Street, this said point being in the division line between lots numbers thirty-four (34) and thirty-five (35), thence running (1) easterly along the division line of lots numbers thirty-four (34) and thirty-five (35), ninety-seven (97) feet, thence (2) northerly and parallel with said Orchard Street fifty (50) feet to the southerly line of lot number thirty-seven (37) thence (3) westerly and along the southerly line of lot number thirty-seven (37) ninety-seven (97) feet to the easterly side of Orchard Street, thence (4) southerly along the easterly side of Orchard Street, fifty (50) feet to the point of beginning.

BEING the same premises conveyed to John Romanelli and Elvira Romanelli, his wife, by Geovanni Filippelli and Elisetta Filippelli, his wife, by deed dated May 23, 1927, recorded in the Bergen County Clerk's Office on May 28, 1927 in Book 1498, page 323 etc.

RECEIVED
1967 JUL -3 AM 11:08
Alexander Allan
BERGEN COUNTY CLERK

30.80 ... STAMPS

BOOK 5060 PAGE 29

10914

This Indenture,

Made the day of in the year of our Lord One Thousand Nine Hundred and

Between WILLIAM T. MUEHLING and LILLIAN F. [illegible], his wife,

of the Borough of Rutherford in the County of Bergen and State of New Jersey,

part of the first part;

And GANE'S CHEMICAL WORKS INCORPORATED, a corporation of New York,

party of the second part:

Witnesseth, That the said party of the first part, for and in consideration of ONE DOLLAR ($1.00) and other good and valuable consideration

lawful money of the United States of America to them in hand well and truly paid by the said party of the second part, at or before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, and the said party of the first part being therewith fully satisfied, contented and paid, ha ve given, granted, bargained, sold, aliened, released, enfeoffed, conveyed and confirmed, and by these presents do give, grant, bargain, sell, alien, release, enfeoff, convey and confirm unto the said party of the second part, and to its successors and assigns forever, All that certain tract or parcel of land and premises, hereinafter particularly described, situate, lying and being in the BOROUGH of RUTHERFORD in the County of BERGEN and State of NEW JERSEY.

Commencing at a point in the northwesterly line of Garden Street as now widened, established and improved, distant south-easterly 145 feet from the intersection of said line of Garden Street, and the northeasterly line of Paterson Avenue, formerly known as the Paterson Plank Road, said point of beginning also being in the northeasterly line of lands heretofore conveyed by the party of the first part to Charles and Frances Foglillo; thence (1) north 46 degrees 00 minutes west parallel with Paterson Avenue, and along the northeasterly line of lands of said Foglillo, 145.55 feet to the southeasterly line of lands of the J.V.C. Terminal Corporation, formerly belonging to Public Service; thence (2) north 38 degrees 33 minutes east, along the southeasterly line of lands of J.V.C. Terminal Corporation, formerly Public Service, and parallel with Garden Street, 400 feet to the southwesterly line of lands now or formerly of Frank Walker, also being the division line between tracts 6 and 7, laid out on the map of property of the Heirs of William Mathe, Dec'd., dated January [illegible], 1890, and filed in the County Clerk's Office at Hackensack, N.J., as Map No. 438; thence (3) south 46 degrees 00 minutes east, along said division line between tracts 6 and 7 and southwesterly line of said Walker, 145.55 feet to the northwesterly line of Garden Street, as now established and improved; thence (4) south 38 degrees 33 minutes west, along the northwesterly line of Garden Street, as now established and improved, 400 feet to the point or place of beginning.

Being the northeasterly portion of a parcel of land conveyed to William T. Muehling by Michael Ollert, by deed dated June 26, [illegible]

$5.50 [illegible] STAMPS

N. J. WARRANTY DEED 181
INDIV. TO INDIV. OR CORP.

10914

THE CHISHOLM PRINTING CO. BOOK [illegible] PAGE 415

This Indenture,

Made the [illegible] *day of* , *in the year of our Lord One Thousand Nine Hundred and*

Between WILLIAM T. MUEHLING and LILLIAN F. MUEHLING, his wife,

of the Borough *of* Rutherford *in the County of* Bergen *and State of* New Jersey,

party of the first part:

And GANE'S CHEMICAL WORKS INCORPORATED, a corporation of New York,

party of the second part:

Witnesseth, *That the said party of the first part, for and in consideration of*

ONE DOLLAR ($1.00) and other good and valuable consideration

lawful money of the United States of America, to them *in hand well and truly paid by the said party of the second part, at or before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, and the said party of the first part being therewith fully satisfied, contented and paid, ha*ve *given, granted, bargained, sold, aliened, released, enfeoffed, conveyed and confirmed and by these presents do* *give, grant, bargain, sell, alien, release, enfeoff, convey and confirm unto the said party of the second part, and to* its successors *and assigns, forever,* All that certain *tract or parcel of land and premises, hereinafter particularly described, situate, lying and being in the* BOROUGH *of* CARLSTADT *in the County of* BERGEN *and State of* NEW JERSEY.

Commencing at a point in the northwesterly line of Garden Street as now widened, established and improved, distant southeasterly 145 feet from the intersection of said line of Garden Street, and the northeasterly line of Paterson Avenue, formerly known as the Paterson Plank Road, said point of beginning also being in the northeasterly line of lands heretofore conveyed by the party of the first part to Charles and Frances Peslillo; thence (1) north 46 degrees 00 minutes west parallel with Paterson Avenue, and along the northeasterly line of lands of said Peslillo, 145.55 feet to the southeasterly line of lands of the J.V.C. Terminal Corporation, formerly belonging to Public Service; thence (2) north 38 degrees 33 minutes east, along the southeasterly line of lands of J.V.C. Terminal Corporation, formerly Public Service, and parallel with Garden Street, 400 feet to the southwesterly line of lands now or formerly of Frank Walker, also being the division line between tracts 6 and 7, laid out on map of property of the Heirs of William Kathe, Dec'd., dated January 2, 1890, and filed in the County Clerk's Office at Hackensack, N.J. as Map No. 438; thence (3) south 46 degrees 00 minutes east along said division line between tracts 6 and 7 and southwesterly line of said Walker, 145.55 feet to the northwesterly line of Garden Street, as now established and improved; thence (4) south 38 degrees 33 minutes west, along the northwesterly line of Garden Street, as now established and improved, 400 feet to the point or place of beginning.

Being the northeasterly portion of a parcel of land conveyed to William T. Muehling by Michael Ollert, by deed dated June [illegible]

$5.50 [illegible] STAMPS

I Mort L O'Connell Sheriff of the County of Bergen do solemnly swear that the land and real estate described in this deed made by me to William H Kelly Commissioner of Banking and Insurance and J Ashley Brown Trustees of Fidelity Union Title and Mortgage Guaranty Company of Newark N J was by me sold by virtue of a good and subsisting execution as is therein recited and that the money ordered to be made has not been to my knowledge or belief paid or satisfied that the time and place of the sale of said land and real estate were by me duly advertised as required by law and that the same was cried off and sold to a bona fide purchaser for the best price that could be obtained

Mort L O'Connell

Sheriff

Sworn before me one of the Masters of the Court of Chancery of New Jersey, on this 16th day of July A D 1934 and I having examined the deed above mentioned do approve the same and ordered it to be recorded as a good and sufficient conveyance of the land and real estate therein described

Dominick F Pachella

Master in Chancery of New Jersey

($.50 Revenue Stamp Cancld)

Received in the office and recorded July 24 1934 at 9.26 A M

James W Mercer Clerk

445271

Franco-American Chemical Works
to
Cane's Chemical Works Inc

Deed Dated July 20 1934

This Indenture made the twentieth day of July in the year of our Lord one thousand nine hundred and thirty-four (1934) between Franco-American Chemical Works a corporation duly created and existing under the laws of the State of New Jersey of the first part and Cane's Chemical Works Inc a corporation duly created and existing under the laws of the State of New York of the second part Witnesseth that the said party of the first part for and in consideration of the sum of sixteen thousand dollars lawful money of the United States of America well and truly paid by the said party of the second part to the said party of the first part at and before the ensealing and delivery of these presents the receipt whereof is hereby acknowledged hath granted bargained sold aliened enfeoffed released conveyed and confirmed and by these presents doth grant bargain sell alien enfeoff release convey and confirm unto the said party of the second part its successors and assigns

All those two certain tracts or parcels of land and premises hereinafter particularly described, situate, lying and being in the Borough of Carlstadt, in the County of Bergen, and State of New Jersey, being part of property as shown on "Map of property of Annie E. Mathe, Carlstadt, N. J. Nov. 1898" (now on file in the Clerk's office of Bergen County, in Hackensack, N. J.) and bounded and described as follows, to wit:

One thereof beginning at a point formed by the intersection of the northeasterly side of Broad Street with the southeasterly side of Garden Street, thence (1) northeasterly and along the southeasterly side of Garden Street one hundred eighty-eight and fifty-nine one-hundredths feet to the division line between lots numbers 7 and 8; thence (2) southeasterly and along said division line one hundred feet to the rear line of lot No. 20; thence (3) northeasterly and along the rear line of lots Nos. 20 and 21 fifty and twenty-two one-hundredths feet to the division line between lots Nos. 21 and 22; thence (4) southeasterly and along said division line one hundred six and eighty-nine one-hundredths feet to the northwesterly side of Orchard Street; thence (5) southwesterly and along said side of Orchard Street two hundred thirty-seven and sixty-nine one-hundredths feet to the northeasterly side of Broad Street; thence (6) northwesterly and along the said side of Broad Street one hundred eighty-six and twenty one-hundredths feet to the point or place of beginning. Containing sixteen and sixty-eight one-hundredths City lots, and being lots No. 1 to No. 7 inclusive, and No. 14, to No. 21 inclusive, as laid down on said map.

And the other thereof being lots numbers eight (8) and nine (9) on said plan, situate on the southeasterly side of Garden Street and bounded as follows: Northwesterly by Garden Street, northeasterly by lot No. 10, southeasterly by lots Nos. 20 and 21, and southwesterly by lot No. 7 on said Plan; said two lots form one plot containing in front, fifty and twenty-two one-hundredths feet and on the rear fifty and twenty-two one-hundredths feet and extending in depth one hundred feet.

As to premises first above described a one-half interest therein was conveyed by Albert Bolle and Marie T. his wife, by Indenture dated October 10, 1894, and recorded in the office of the Clerk of Bergen County in Book No. 590 of Deeds, pages 164 &c. unto The Trubek Chemical Works, its successors and assigns; and the other one-half interest therein H. Charles Euler, et ux. by Indenture dated January 16, 1909, and recorded in said office in Book No. 715 of Deeds, pages 544 &c. granted and conveyed unto The Trubek Chemical Works, its successors and assigns.

And by proceedings duly had, the name of The Trubek Chemical Works was changed to Franco-American Chemical Works, which proceedings were duly filed in the office of the Secretary of State on March 11, 1909.

And as to premises last above described William Mathe and Annie E. his wife, by Indenture dated April 11, 1912, and recorded in the office aforesaid in Book No. 812 of Deeds, pages 180 &c., granted and conveyed unto the Franco-American Chemical Works, its successors and assigns.

Excepting from the tracts above described theland conveyed to the Borough of Carlstadt for the widening of Garden Street, by deed made by Franco-American Chemical Works, a New Jersey corporation, dated June 16, 1925, and recorded in Book No. 1337, of Deeds, page 361. And subject to the easement, if any, of right of way granted by Max Mathe, et al, to John B. Barbour, by deed dated November 11, 1880, and recorded in the Bergen County Clerk's office in Book T-10, of Deeds on page 178.

Together with all and singular the improvements buildings woods ways rights liberties privileges hereditaments and appurtenances to the same belonging or in anywise appertaining and the reversion and reversions remainder and remainders rents issues and profits thereof and of every part and parcel thereof And also all the estate right title interest property possession claim and demand whatsoever both in law and equity of the said party of the first part of in and to the said premises and every part thereof with the appurtenances

To have and to hold the said premises above described with all and singular the hereditaments and appurtenances unto the said party of the second part its successors and assigns to the only proper use benefit and behoof of the said party of the second part its successors and assigns forever Under and subject as aforesaid And the said party of the first part for itself and its successors doth by these presents covenant grant and agree to and with the said party of the second part its successors and assigns that it the said party of the first part and its successors all and singular the hereditaments and premises above described and granted or mentioned and intended so to be with the appurtenances unto the said party of the second part its successors and assigns against it the said party of the first part and its successors and against all and every person or persons whomsoever lawfully claiming or to claim the same or any part thereof by from or under it them or any of them shall and will subject as aforesaid warrant and forever defend

In witness whereof the said party of the first part to these presents hath hereunto set its common or corporate seal duly attested the day and year first above written dated the day and year first above written

Signed sealed and delivered
in the presence of
Katharine G Herzberg

Franco-American Chemical Works (Seal)
By W H Hoodless President
(Seal reads: Franco-American Chemical Works New Jersey)

Attest
H H Jones Secretary

corporation that the said seal was so affixed and the said instrument signed and delivered by Orrie De Nooyer who was at the date thereof the President of said corporation in the presence of this deponent and said President at the same time acknowledged that he signed sealed and delivered the same as his voluntary act and deed and as the voluntary act and deed of said corporation by virtue of authority from its Board of Directors and that deponent at the same time subscribed his name to said instrument as an attesting witness to the execution thereof

Sworn and subscribed before me at
Garfield N J the date aforesaid
Stephen Toth Jr
An Attorney at Law of N J

Alfred D Cella

($5.00 Revenue stamps cancld)
Received in the office and recorded Aug 22 1940 at 8:54 A M
James W Mercer Clerk

688076

Josephine Trubek Extr etc et als
to
Gane's Chemical Works Inc

Deed dated Aug 1 1940

This indenture made the first day of August in the year of our Lord one thousand nine hundred and forty between Josephine Trubek, Leo Trubek and Max Trubek Executors under the Last Will and Testament of Moses Trubek deceased and Josephine Trubek, Leo Trubek and Max Trubek and Rutherford National Bank of Rutherford New Jersey as Trustees under the Last Will and Testament of Moses Trubek deceased late of the Borough of Carlstadt in the County of Bergen and State of New Jersey parties of the first part and Gane's Chemical Works Inc a corporation of the State of New York with its principal office and place of business at No. 43 West 16th Street in the City County and State of New York party of the second part Witnesseth that the said parties of the first part by virtue of the power and authority to them given in and by said Last Will and Testament and for and in consideration of the sum of five thousand ($5,000.00) dollars lawful money of the United States of America to them in hand paid by the said party of the second part at or before the ensealing and delivery of these presents the receipt whereof is hereby acknowledged have granted bargained sold and conveyed and by these presents do grant bargain sell and convey unto the said party of the second part and to its successors and assigns forever

All those tract or parcel of land and premises, hereinafter particuarly described, situate, lying and being in the Borough of Carlstadt in the County of Bergen and State of New Jersey.

Vol. 2234/Pg. 184

First Tract: Being known and distinguished on a certain map entitled "Map of Property of Annie E. Mathe, Carlstadt, N. J." which map is filed in the office of the Clerk of Bergen County as Lot Number thirty-four (34) on the easterly side of Orchard Street.

Second Tract: Beginning at a point on the northwesterly side of Lincoln Street distant 100 feet northeasterly from the northeasterly side of Broad Street, running thence (1) northwesterly and parallel with Broad Street 54.36 feet; thence (2) northeasterly and nearly parallel with said Lincoln Street 38.10 feet; thence (3) southeasterly 55.51 feet to the said side of Lincoln Street; thence (4) southwesterly and along said side of Lincoln Street 38.10 feet to the point or place of beginning. Being further known and designated as part of lot 58 as laid out on a certain map entitled "Map of Property of Wilhelmina C. Steinle at Carlstadt, N. J., L. Losier, Civil Engineer and Surveyor, Hackensack, N. J., July, 1894.

Third Tract: Being known and distinguished on a certain map entitled Map of Property of Annie E. Mathe, Carlstadt, New Jersey, dated November, 1898, filed in the Bergen County Clerk's Office as Lots No. 30, 31, 32 and 33 situated on the easterly corner of Broad and Orchard Streets and described as follows:- Beginning on the easterly corner of said Broad and Orchard Streets and running thence (1) northeasterly along the southeasterly side of Orchard Street 112.81 feet to Lot No. 34; thence (2) southeasterly along the southwesterly line of Lot No. 34, 100 feet to lands now or formerly of F. Steinle; thence (3) southwesterly along the northwesterly line of lands now or formerly of F. Steinle 113.10 feet to Broad Street; thence (4) northwesterly along the northeasterly line of Broad Street 100 feet to the point or place of beginning, all as laid down on said map.

Fourth Tract: Known and designated on a certain map filed in the Clerk's Office of said County of Bergen August 9, 1894 entitled Map of Property of Wilhelmina C. Steinle at Carlstadt, N. J., as Lots Nos. 56 and 57, all as laid down on said map. Being the same premises conveyed to parties of the first part by Mort L. O'Connell, Sheriff of the County of Bergen, by deed dated July 23, 1936, and recorded in the Bergen County Clerk's Office on August 4, 1936, in Book 2021 of deeds for said County on page 481. It is understood that the said Rutherford National Bank of Rutherford, New Jersey, has no financial interest in the foregoing lands and premises, and that they join in the same as a party grantor by virtue of the fact that their name appears as a party grantee in the aforementioned Sheriff's deed.

Together with all and singular the tenements hereditaments and appurtenances thereunto belonging or in anywise appertaining and the reversion and reversions remainder and remainders rents issues and profits thereof And also all the estate right title interest property possession claim and demand whatsoever as well in law as in equity of the said parties of the first part and of the said Testator of in and to the above described premises and every part and parcel thereof with the appurtenances

To have and to hold all and singular the above mentioned and described premises together with the appurtenances unto the said party of the second part its successors and assigns forever And the said parties of the first part do hereby covenant promise and agree to and with the said party of the second part its successors and assigns that they have not as such executors and trustees as aforesaid done or caused suffered or procured to be done any act matter or thing whereby the said premises or any part thereof with the appurtenances are or may be charged or encumbered in estate title or otherwise

In witness whereof the said individual parties of the first part have hereunto set their hands and seals and the corporate party of the first part has caused these presents to be signed by its duly authorized officers and its corporate seal to be hereto affixed the day and year first above written

Signed sealed and delivered
in the presence of
C A Rodenburg
As to Josephine Trubek
C A Rodenburg
As to Leo Trubek
Spencer T Manser
As to Max Trubek

Josephine Trubek (LS)
Leo Trubek (LS)
Max Trubek (LS)
Executors under the Last Will and Testament of Moses Trubek deceased

Signed sealed and delivered
in the presence of
C A Rodenburg
As to Josephine Trubek
C A Rodenburg
As to Leo Trubek
Spencer T Manser
As to Max Trubek
Attest
Samuel W Thompson
Cashier

Josephine Trubek (LS)
Leo Trubek (LS)
Max Trubek (LS)
Rutherford National Bank of
Rutherford New Jersey (Seal)
By M W Beeton Vice President
(Seal reads: Rutherford National Bank Rutherford N J Organized May 8 1895)
Trustees under the Last Will and Testament of Moses Trubek deceased

State of New Jersey
County of Bergen ss Be it remembered that on this 1st day of August in the year of our Lord one thousand nine hundred and forty before me the subscriber a Notary Public of New Jersey personally appeared Josephine Trubek one of the Executors and Trustees under the Last Will and Testament of Moses Trubek deceased who I am satisfied is one of the grantors mentioned in the within instrument to whom I first made known the contents thereof and thereupon she acknowledged that she signed sealed and delivered the same as her voluntary

FEBRUARY 2, 2000

HISTORICAL CHAIN OF TITLE REPORTS

Real Estate Research
& Information

2055 East Rio Salado Parkway
Tempe, Arizona 85281
(480) 967-6752
(480) 966-9422 Fax
www.netronline.com

HISTORICAL CHAIN OF TITLE REPORT

GANES CHEMICAL
630 BROAD STREET
CARLSTADT, NEW JERSEY

Submitted to:

ENVIRONMENTAL DATA RESOURCES, INC.
C/O
MCLAREN / HART, INC.
470 Norristown Road
Blue Bell, Pennsylvania 19422
610-567-1500

Attention: Lara Herzig

Project No. N99-2128R

February 2, 2000

Nationwide Environmental Title Research hereby submits the following ASTM historical chain-of-title to the land described below, subject to the leases/miscellaneous shown in Section 2. Title to the estate or interest covered by this report appears to be vested in:

GANES CHEMICAL, INC.

The following is the current property legal description:

All those certain pieces or parcels of land being further bound and described in the attached vesting deeds, lying and situate in the Borough of Carlstadt, the County of Bergen, and State of New Jersey.

1. HISTORICAL CHAIN OF TITLE

CHAIN ONE: Conveying Lot 2, Block 23

1. Mary Fill and husband acquired title to the property prior to 1900.

2. DEED:

RECORDED:	09-28-1931
GRANTOR:	Mary Fill, widow
GRANTEE:	Arthur E. Fill & Catherine Fill
INSTRUMENT:	Bk 1801, Pg 6

3. WARRANTY DEED:

RECORDED:	02-24-1955
GRANTOR:	Mary Fill, et vir
GRANTEE:	Catherine Fill
INSTRUMENT:	Bk 3626, Pg 346

4. WARRANTY DEED:

RECORDED:	06-27-1967
GRANTOR:	Catherine Fill
GRANTEE:	Louis Van Hentenryck, et ux
INSTRUMENT:	Bk 5056, Pg 202

5. BARGAIN & SALE DEED:

RECORDED:	09-18-1972
GRANTOR:	Louis Van Hentenryck
GRANTEE:	Ann M. Van Hentenryck
INSTRUMENT:	Bk 5694, Pg 207

6. BARGAIN & SALE DEED:

RECORDED:	08-07-1978
GRANTOR:	Ann Marie Van Hentenryck, unmarried
GRANTEE:	John J. Eckert & Joanne Eckert, his wife
INSTRUMENT:	Bk 6417, Pg 454

7. DEED:

RECORDED:	10-13-1998
GRANTOR:	Joanne L. Eckert, widow
GRANTEE:	Ganes Chemicals, Inc.
INSTRUMENT:	Bk 8109, Pg 591

CHAIN TWO: Conveying Lot 8, Block 18

8. Cono Scaffidi Saggio and wife acquired title to the property prior to 1900.

9. DEED:

RECORDED:	09-15-1936
GRANTOR:	Cono Scaffidi Saggio, et ux
GRANTEE:	Maria Miragliotta, et vir
INSTRUMENT:	Bk 2031, Pg 87

10. DEED:

RECORDED:	05-29-1946
GRANTOR:	Maria Miragliotta, et vir
GRANTEE:	Catherine Herold
INSTRUMENT:	Bk 2641, Pg 489

11. BARGAIN & SALE DEED:

RECORDED:	02-03-1981
GRANTOR:	Catherine Herold, widow
GRANTEE:	Ganes Chemicals, Inc.
INSTRUMENT:	Bk 6614, Pg 511

CHAIN THREE: Conveying Lot 11, Block 19

12. Henry Hammond & wife acquired title to the property prior to 1900.

12. WARRANTY DEED:

RECORDED:	11-14-1945
GRANTOR:	Henry Hammond, et ux
GRANTEE:	Kathleen Kuenzle, et vir
INSTRUMENT:	Bk 2576, Pg 375

13. WARRANTY DEED:

RECORDED:	01-21-1952
GRANTOR:	Kathleen Kuenzle, et vir
GRANTEE:	Leonard Pati, et ux
INSTRUMENT:	Bk 3287, Pg 214

14. BARGAIN & SALE DEED:

RECORDED:	10-01-1981
GRANTOR:	Leonard Patti, et ux
GRANTEE:	Anthony Rinaldi, et ux
INSTRUMENT:	Bk 6655, Pg 227

15. BARGAIN & SALE DEED:

RECORDED: 02-04-1988
GRANTOR: Anthony Rinaldi & Sharon Rinaldi
GRANTEE: Sharon Rinaldi
INSTRUMENT: Bk 7180, Pg 442

16. DEED:

RECORDED: 11-08-1989
GRANTOR: Sharon Rinaldi
GRANTEE: Ganes Chemicals, Inc.
INSTRUMENT: Bk 7330, Pg 782

CHAIN FOUR: Conveying Lot 9, Block 18

17. Marie Rasmussen and husband acquired title to the property prior to 1900.

18. WARRANTY DEED:

RECORDED: 10-05-1918
GRANTOR: Marie Rasmussen, widow
GRANTEE: Antonio Antonicelli, et ux
INSTRUMENT: Bk 996, Pg 490

19. WARRANTY DEED:

RECORDED: 08-13-1959
GRANTOR: Antonio Antonicelli, et ux
GRANTEE: Angelo A. Glionna, et ux
INSTRUMENT: Bk 4058, Pg 115

20. WARRANTY DEED:

RECORDED: 10-13-1960
GRANTOR: Antonio Antonicelli & Maria Antonicelli, his wife
GRANTEE: Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT: Bk 4175, Pg 299
COMMENTS: Conveying lots previously known as Lots 22 & 23

21. WARRANTY DEED:

RECORDED: 10-13-1960
GRANTOR: Angelo A. Glionna & Claire Glionna, his wife
GRANTEE: Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT: Bk 4175, Pg 302
COMMENTS: Conveying lots previously known as Lots 24 & 25

CHAIN FIVE: Conveying Lot 7, Block 18

22. Clarence E. Mathe and wife acquired title to the property prior to 1900.

23. DEED:

RECORDED:	08-03-1939
GRANTOR:	Clarence E. Mathe, et ux
GRANTEE:	Nicholas Micci, et ux
INSTRUMENT:	Bk 2173, Pg 233

24. WARRANTY DEED:

RECORDED:	10-25-1966
GRANTOR:	Nicholas Micci & Margaret Micci, his wife
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 4983, Pg 406
COMMENTS:	Conveying two tracts of land; Tract 1 being the Westerly portion and Tract 2 being the Easterly portion of the lot.

CHAIN SIX: Conveying Lot 9, Block 19

25. Geovanni Fillipelli and wife acquired title to the property prior to 1900.

26. DEED:

RECORDED:	05-23-1927
GRANTOR:	Geovanni Fillipelli, et ux
GRANTEE:	John Romanelli, et ux
INSTRUMENT:	Bk 1498, Pg 323

27. WARRANTY DEED:

RECORDED:	07-03-1967
GRANTOR:	John Romanelli & Elvira Romanelli, his wife
GRANTEE:	Gane's Chemical Works, Inc.
INSTRUMENT:	Bk 5060, Pg 29

CHAIN SEVEN: Conveying Lot 8, Block 2

28. Michael Ollert acquired title to the property prior to 1900.

29. DEED:

RECORDED:	06-26-1933
GRANTOR:	Michael Ollert
GRANTEE:	William T. Muehling, et ux
INSTRUMENT:	Bk 1890, Pg 67

30. WARRANTY DEED:

RECORDED:	03-10-1947
GRANTOR:	William T. Muehling & Lillian G. Muehling, his wife
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 2735, Pg 415

CHAIN EIGHT: Conveying Lot 10, Block 18

31. Albert Bolle & Marie T. Bolle acquired title to a portion of the property prior to 1900.

32. H. Charles Euler and wife acquired title to a portion of the property prior to 1900.

33. William Mathe & Annie E. Mathe acquired title to a portion of the property prior to 1900.

34. DEED:

RECORDED:	10-10-1894
GRANTOR:	Albert Bolle & Marie T. Bolle
GRANTEE:	The Trubek Chemical Works, Inc.
INSTRUMENT:	Bk 590, Pg 164

35. DEED:

RECORDED:	01-16-1909
GRANTOR:	H. Charles Euler, et ux
GRANTEE:	The Trubek Chemical Works, Inc.
INSTRUMENT:	Bk 715, Pg 544

36. WARRANTY DEED:

RECORDED:	04-11-1912
GRANTOR:	William Mathe & Annie E. Mathe, his wife
GRANTEE:	Franco-American Chemical Works
INSTRUMENT:	Bk 812, Pg 180

37. WARRANTY DEED:

RECORDED:	07-24-1934
GRANTOR:	Franco-American Chemical Works
GRANTEE:	Gane's Chemical Works, Inc.
INSTRUMENT:	Bk 1932, Pg 481
COMMENTS:	Name of The Trubek Chemical Works changed to Franco-American Chemical Works, filed on 03-11-1909; conveyed property from both companies.

CHAIN NINE: Conveying Lot 10, Block 19

38. Moses Trubek assembled and acquired title to the property prior to 1900.

38. DEED:

RECORDED:	08-22-1940
GRANTOR:	Josephine Trubek, Leo Trubek, and Max Trubek, as Executors under the Last Will & Testament of Moses Trubek, deceased; and Josephine Trubek, Leo Trubek, and Max Trubek, and Rutherford National Bank of Rutherford, New Jersey, as Trustees under Last Will & Testament of Moses Trubek, deceased
GRANTEE:	Gane's Chemical Works, Inc., a New York corporation
INSTRUMENT:	Bk 2234, Pg 184

CHAIN TEN: Conveying Lot 1, Block 23

39. DEED:

RECORDED:	10-29-1892
GRANTOR:	Maria Schreiber, et vir
GRANTEE:	John Keller
INSTRUMENT:	Bk 346, Pg 668
COMMENTS:	Conveying a portion of the property.

40. DEED:

RECORDED:	05-06-1903
GRANTOR:	John Keller, et ux
GRANTEE:	Marie Vitous
INSTRUMENT:	Bk 562, Pg 199

41. DEED:

RECORDED:	09-04-1904
GRANTOR:	George Zimmerman, et ux
GRANTEE:	Erdman E. Scharg and Christof Scharg
INSTRUMENT:	Bk 588, Pg 386
COMMENTS:	Conveying a portion of the property; Grantor herein acquired title to the property prior to 1900.

42. DEED:

RECORDED:	10-24-1904
GRANTOR:	George Fleidel, et ux
GRANTEE:	Erdman E. Scharg and Christof Scharg
INSTRUMENT:	Bk 591, Pg 46
COMMENTS:	Conveying a portion of the property; Grantor herein acquired title to the property prior to 1900.

43. DEED:

RECORDED:	12-19-1947
GRANTOR:	Wilhelmina C. Steinle
GRANTEE:	Erdman E. Scharg and Christof Scharg
INSTRUMENT:	Bk 2821, Pg 490
COMMENTS:	Conveying a portion of the property; Grantor herein acquired title to a portion of the property prior to 1900.

44. DEED:

RECORDED:	12-19-1947
GRANTOR:	Erdman E. Scharg and Christof Scharg
GRANTEE:	Scharg Brothers, Inc.
INSTRUMENT:	Bk 2821, Pg 493
COMMENTS:	Conveying several tracts of land that make up the subject property.

45. JUDGMENT DEED (FORECLOSURE):

RECORDED:	05-27-1960
GRANTOR:	Marie Vitous, et al
GRANTEE:	Carl W. Zeidler, et ux
INSTRUMENT:	Bk 4126, Pg 58

46. BARGAIN AND SALE DEED:

RECORDED:	09-09-1960
GRANTOR:	Carl W. Zeidler, et ux
GRANTEE:	Scharg Brothers, Inc.
INSTRUMENT:	Bk 4163, Pg 371

47. BARGAIN AND SALE DEED:

RECORDED:	09-08-1978
GRANTOR:	Scharg Brothers, Inc.
GRANTEE:	Ganes Chemical, Inc.
INSTRUMENT:	Bk 6434, Pg 27
COMMENTS:	Conveying subject property.

2. LEASES AND MISCELLANEOUS

1. ACCESS & EASEMENT AGREEMENT:

RECORDED:	10-05-1993
GRANTOR:	Ganes Chemicals, Inc., a New Jersey corporation
GRANTEE:	The Borough of Carlstadt, a municipal corporation
INSTRUMENT:	Bk 7642, Pg 515
COMMENTS:	The document contains a legal description for Lot 1, Block 23; the Grantor herein is stated to be the owner of said property.

2. No leases or environmental liens were found of record.

3. LIMITATION

This report was prepared for the use of Environmental Data Resources, Inc., and McLaren/Hart, Inc., exclusively. This report is neither a guarantee of title, a commitment to insure, or a policy of title insurance. Nationwide Environmental Title Research does not guarantee nor include any warranty of any kind whether expressed or implied, about the validity of all information included in this report since this information is retrieved as it is recorded from the various agencies that make it available. The total liability is limited to the fee paid for this report.

104—DEED - BARGAIN AND SALE (COVENANT AGAINST GRANTOR) A D G R V CORP. TO IND. OR CORP.

This Deed, made the 31st day of August 1978

RECEIVED 1978 SEP -8 PM 3:31 BERGEN COUNTY CLERK

Between SCHARG BROTHERS, INC.

a corporation existing under and by virtue of the laws of the State of New Jersey having its principal office at Hoboken Road and Garden Street in the Borough of Carlstadt in the County of Bergen and State of New Jersey herein designated as the Grantor,

And

GANES CHEMICALS, INC.

residing or located at 1114 Avenue of the Americas in the City of New York in the County of New York and State of New York herein designated as the Grantees;

Witnesseth, that the Grantor, for and in consideration of

--------------LESS THAN ONE HUNDRED ($100.00) DOLLARS --------------

lawful money of the United States of America, to it in hand well and truly paid by the Grantees, at or before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, and the Grantor being therewith fully satisfied, does by these presents grant, bargain, sell and convey unto the Grantees forever,

All that tract or parcel of land and premises, situate, lying and being in the Borough of Carlstadt in the County of Bergen and State of New Jersey, more particularly described herein.

Tax Map Reference: (NJS 46: 15-2.1) Municipality of: Carlstadt Account No. Block No. 8 Lot No. 1, 1xx, 1xxx

[X] No property tax identification number is available on date of this deed. (Check box if applicable.)

FIRST TRACT: BEING known and distinguished on a certain Map entitled, "Map of the Property of the Heirs of William Mathe deceased," filed in the Bergen County Clerk's Office as part of plot No. 2.

BEGINNING on the division line between lands late of William Mathe and lands now or late of John O. Grode & Co. at its intersection with the centre line of Broadway, if extended, and running (1) South Forty-four (44) degrees and forty-five (45) minutes and thirty (30) seconds West along said division line two hundred sixty feet and seventy-five one-hundredths of a foot (260.75') to lands of Henry Ringle; thence (2) North forty-five (45) degrees and thirty-three (33) minutes West along lands of Henry Ringle three hundred twenty feet and ninety-four one-hundredths of a foot (320.94') to the centre line of Garden Street; thence (3) North thirty-nine (39) degrees thirty-nine (39) minutes East along said centre line of Garden Street one hundred forty feet and eighty-eight one-hundredths of a foot (140.88') to lands of John Keller; thence (4) South forty-three (43) degrees and fifty-four (54)

lands of John Keller; thence (4) South forty-three (43) degrees and fifty-four (54)

minutes east along lands of John Keller eighty-three feet and thirty-six one-hundredths of a foot (83.36'); thence (5) North forty-six (46) degrees and six (6) minutes East still along line of lands of John Keller one hundred thirty (130) feet to centre line of Broadway if extended; thence (6) South forty-three (43) degrees and fifty-four (54) minutes east along centre line of Broadway if extended, two

[2]

hundred forty-seven feet and twenty-five one-hundredths of a foot (247.25') to the point or place of BEGINNING. Containing 1.759 acres.

SECOND TRACT: KNOWN on a certain Map entitled, "Map of Property of the Heirs of Wm. Mathe, deceased, filed in the Bergen County Clerk's Office as tract number one (1).

BEGINNING at a point on the southwesterly corner of the land formerly of John O. Grode & Co., and Hoboken Road or Street, and running thence (1) Westerly along said Hoboken Road or Street two hundred and ninety-six (296) feet to the center of the public road leading from the Paterson Plank Road to the lands of Magdalana Engel and others; thence (2) Northerly along the centre line of said public road two hundred and ninety (290) feet; thence (3) Easterly and parallel with said Hoboken Road or Street three hundred and twenty-two (322) feet to lands formerly of John O. Grode & Company; thence (4) Southerly along said lands formerly of John O. Grode and Company two hundred and eighty-eight (288) feet to the place of BEGINNING.

THIRD TRACT: KNOWN and designated on a certain Map filed in the Clerk's Office of said County of Bergen; August 9th, 1894, entitled, "Map of property of Wilhelmina C. Steinle at Carlstadt, N.J." as Lots Numbers Twenty-five (25), Twenty-six (26), Twenty-seven (27, Twenty-eight (28) and Twenty-nine (29).

Lot Number Twenty-five (25) is located on the northwest corner of Hoboken and Lincoln Streets. Lots Twenty-six (26), Twenty-seven (27), Twenty-eight (28) and Twenty-nine (29) front on the west side of Lincoln Street, all as laid down on said map.

FOURTH TRACT: KNOWN AND DISTINGUISHED on a certain map entitled, "Map of the Property of the Heirs of William Mathe deceased" on file in the Bergen County Clerk's Office as part of Plot number two (2), beginning at a point where the southerly line of Broad Street of Carlstadt (if extended and opened) westerly would join the easterly line of the public road known as the Lodi Public Road, and now known as Garden Street, thence (1) Southeasterly along the southerly line of said Broad Street line seventy-four (74) feet; thence (2) At right angles with said line of Broad Street southwesterly one hundred (100) feet; thence (3) Northwesterly and [illegible] [*]
of the aforesaid Public Road; thence (4) Northeasterly along the same one hundred (100) feet and six and one-half (6½) inches to the point of BEGINNING.

EXCEPTING therefrom so much thereof as was conveyed to the Borough of Carlstadt for the widening of Garden Street by Deed Book 1347 Page 45 and being more particularly described as follows:

CONTINUED ON RIDER ATTACHED

LEGAL DESCRIPTION ATTACHED TO DEED MADE BY
SHARG BROTHERS, INC. TO GANES CHEMICALS, INC.
DATED AUGUST 31, 1978

BEGINNING at the junction of the northeasterly line of Hoboken Road with the southeasterly line of Garden Street as now laid out; from thence running (1) Northeasterly along the present line of Garden Street 532 feet more or less to its intersection with the southwesterly line of Broad Street, thence (2) Southeasterly along said line of Broad Street 4.4 feet more or less to a point distant therein 4.375 feet measured as right angles from the southeasterly line of Garden Street; thence (3) Southwestarly and parallel with the first course and at all times distant 4.375 feet at right angles therefrom 532 feet more or less to the northeasterly line of Hoboken Road; thence (4) Northwesterly along said line of Hoboken Road 4.4 feet more or less to the point or place of BEGINNING.

BEING the same premises conveyed to the grantor by Deed from Erdman E. Scharg also known as Erdmann E. Scharg and Erdmann Ernest Scharg, Widower, Christof C. Scharg also known as Christof Scharg also known as Christof Charles Scharg and Christof E. Scharg and Augusta Scharg, his wife, dated December 12, 1948, and recorded in Book 2821, at Page 493 and by Deed from Carl W. Zeidler and Ida Zeidler, his wife, dated September 8, 1960, and recorded September 9, 1960, in Book 4163, at Page 371 in the Bergen County Clerk's Office.

THE grantor corporation was dissolved by action of its stockholders on June 22, 1972.

[2]

APPENDIX B

HISTORY OF OPERATIONS
(Questions 2A & 2B)

GEE
"START"

APPENDIX B-1

HISTORICAL INFORMATION REVIEW

APPENDIX B-1
HISTORICAL INFORMATION REVIEW

The following is a description of historical activities conducted at the subject property. The information was obtained through review of historical Sanborn Fire Insurance maps, historical site plans, aerial photograph review, Chain-of-Title searches, facility records review and interviews with knowledgeable employees and site representatives.

The descriptions have been categorized by facility area (Block) and further by parcel lot number.

GARDEN STREET FACILITY PROPERTY (GSFP) (BLOCK 18, LOTS 6-10)

GSFP - LOT 6, BLOCK 18			
Date	*Property Description*	*Operation/Use*	*Source*
1909	Lot 6 is occupied by a residential dwelling.	Residential	1909 Sanborn Map *Appendix K-2*
1917	Lot 6 appears the same as in the 1909 Sanborn Map.	Residential	1917 Sanborn Map *Appendix K-2*
1922	Lot 6 appears the same as in the 1917 Sanborn Map.	Residential	1922 Sanborn Map *Appendix K-2*
1940	Lot 6 appears the same as in the 1922 Sanborn Map.	Residential	1940 Aerial Photograph
1946	Lot 6 appears the same as in the 1940 Aerial Photograph.	Residential	1946 Historical Site Plan *Appendix K-1*
1949	Lot 6 appears the same as in the 1946 Historical Site Plan.	Residential	1949 Historical Site Plan *Appendix K-1*
1951	Lot 6 appears the same as in the 1949 Historical Site Plan.	Residential	1951 Aerial Photograph
1968	Lot 6 appears the same as in the 1951 Aerial Photograph.	Residential	1968 Sanborn Map *Appendix K-2*
1987	Lot 6 appears similar to the present time. The residential dwelling has been removed by Ganes and Lot 6 is converted to a parking lot.	Asphalt Parking Lot	1987 Aerial Photograph *Appendix K-3*
1995	Lot 6 appears similar to the present time.	Asphalt Parking Lot	1995 Aerial Photograph

GSFP - LOT 7, BLOCK 18			
Date	*Property Description*	*Operations/Use*	*Source*
Pre 1900s	Lot 7 is owned by Clarence E. Mathe.	Unknown	Chain of Title Report *Appendix A-3*
1909	Lot 7 is occupied by small shed possibly associated with the residential house located on Lot 6.	Shed	1909 Sanborn Map *Appendix K-2*
1917	Lot 7 appears the same as in the 1909 Sanborn Map.	Shed	1917 Sanborn Map *Appendix K-2*
1922	Lot 7 appears the same as in the 1917 Sanborn Map.	Shed	1922 Sanborn Map *Appendix K-2*
1939	Lot 7 is owned by Nicholas Micci	Shed	Chain of Title Report *Appendix A-3*
1940	Lot 7 appears the same as in the 1922 Sanborn Map.	Shed	1940 Aerial Photograph

GSFP - LOT 7, BLOCK 18			
Date	***Property Description***	***Operations/Use***	***Source***
1946	Lot 7 is occupied by a residential dwelling.	Residential	1946 Historical Site Plan *Appendix K-1*
1949	Lot 7 appears the same as in the 1946 Historical Site Plan.	Residential	1949 Historical Site Plan *Appendix K-1*
1951	Lot 7 appears the same as in the 1949 Historical Site Plan.	Residential	1951 Aerial Photograph
1966	Lot 7 is purchased by Ganes Chemical Works.	Residential	Chain of Title Report *Appendix A-3*
1968	Lot 7 appears the same as in the 1951 Aerial Photograph.	Residential	1968 Sanborn Map *Appendix K-2*
1987	Lot 7 appears the same as in the 1968 Sanborn Map.	Residential	1987 Aerial Photograph *Appendix K-3*
1995	Lot 7 appears similar to the present time (occupied by a residential dwelling).	Residential	1995 Aerial Photograph

GSFP - LOT 8, BLOCK 18			
Date	***Property Description***	***Operations/Use***	***Source***
Pre 1900s	Lot 8 is owned by Cono Scaffidi Saggio.	Unknown	Chain of Title Report *Appendix A-3*
1909	Lot 8 is occupied by a residential dwelling.	Residential	1909 Sanborn Map *Appendix K-2*
1917	Lot 8 appears the same as in the 1909 Sanborn Map.	Residential	1917 Sanborn Map *Appendix K-2*
1922	Lot 8 appears the same as in the 1917 Sanborn Map.	Residential	1922 Sanborn Map *Appendix K-2*
1936	Lot 8 is purchased by Maria Miragliott.	Residential	Chain of Title Report *Appendix A-3*
1940	Lot 8 appears the same as in the 1922 Sanborn Map.	Residential	1940 Aerial Photograph
1946	Lot 8 is purchased by Catherine Herold.	Residential	Chain of Title Report *Appendix A-3*
1946	Lot 8 appears the same as in the 1940 Aerial Photograph with the exception of the addition of two sheds/garages associated with the residential dwelling.	Residential	1946 Historical Site Plan *Appendix K-1*
1949	Lot 8 appears the same as in the 1946 Historical Site Plan.	Residential	1949 Historical Site Plan *Appendix K-1*
1951	Lot 8 appears the same as in the 1949 Historical Site Plan.	Residential	1951 Aerial Photograph
1968	Lot 8 appears the same as in the 1951 Aerial Photograph.	Residential	1968 Sanborn Map *Appendix K-2*
1977	Lot 8 appears the same as in the 1968 Sanborn Map.	Residential	1977 Historical Site Plan *Appendix K-1*
1981	Ganes Chemicals Inc. purchases Lot 8.	Residential	Chain of Title Report *Appendix K-3*
1981	Lot 8 appears the same as in the 1977 Historical Site Plan.	Residential	1981 Historical Site Plan *Appendix K-3*

GSFP - LOT 8, BLOCK 18			
Date	***Property Description***	***Operations/Use***	***Source***
1987	Lot 8 appears the same as in the 1981 Historical Site Plan.	Residential	1987 Aerial Photograph *Appendix K-3*
1989	Ganes constructs the Quality Control Lab on Lot 8.	Residential & Quality Control Lab	Facility Records
1995	Lot 8 appears similar to the present time.	Residential & Quality Control Lab	1995 Aerial Photograph
1998	Residential dwelling removed from Lot 8.	Quality Control Lab & Parking Area	Site Representatives

GSFP - LOT 9, BLOCK 18			
Date	***Property Description***	***Operations/Use***	***Source***
Pre 1900s	Lot 9 is owned by Maria Rasmaussen.	Unknown	Chain of Title Report *Appendix A-3*
1909	Lot 9 is vacant.	Undeveloped	1909 Sanborn Map *Appendix K-2*
1917	Lot 9 is occupied by a residential dwelling.	Residential	1917 Sanborn Map *Appendix K-2*
1918	Lot 9 is purchased by Antonio Antonicelli.	Residential	Chain of Title Report *Appendix A-3*
1922	Lot 9 appears the same as in the 1917 Sanborn Map.	Residential	1922 Sanborn Map *Appendix K-2*
1940	Lot 9 appears the same as in the 1922 Sanborn Map.	Residential	1940 Aerial Photograph
1946	Lot 9 appears the same as in the 1940 Aerial Photograph with the exception of the addition of several sheds and a garage.	Residential	1946 Historical Site Plan *Appendix K-1*
1959	A portion of Lot 9 is purchased by Angelo Clionna.	Residential	Chain of Title Report *Appendix A-3*
1960	Lot 9 is purchased by Ganes Chemical Works, Inc.	Residential	Chain of Title Report *Appendix A-3*
1968	Lot 9 appears the same as in the 1946 Aerial Photograph.	Residential	1968 Sanborn Map *Appendix K-2*
1977	Lot 9 appears the same as in the 1968 Sanborn Map.	Residential	1977 Historical Site Plan *Appendix K-1*
1981	Ganes constructs the Research and Development Center on Lot 9.	Research and Development Center	1981 Historical Site Plan *Appendix K-1*
1987	Lot 9 appears similar to present time.	Research and Development Center	1987 Aerial Photograph *Appendix K-3*
1995	Lot 9 appears similar to the present time.	Research and Development Center	1995 Aerial Photograph

GSFP - LOT 9, BLOCK 18			
Date	***Property Description***	***Operations/Use***	***Source***
1999	Ganes Chemicals vacated the building that is currently under construction for conversion to an office building by the new property owners.	Office Building	Observations

GSFP - LOT 10, BLOCK 18			
Date	***Property Description***	***Operations/Use***	***Source***
1894	The Trubek Chemical Works acquires a portion of Lot 10.	Pharmaceutical Manufacturing	Chain of Title Report *Appendix A-3*
1909	The Trubek Chemical Works acquires an additional portion of Lot 10.	Pharmaceutical Manufacturing	Chain of Title Report *Appendix A-3*
1909	The name of Trubek Chemical Works changed to Franco-American Chemical Works.	Pharmaceutical Manufacturing	Chain of Title Report *Appendix A-3*
1909	Lot 10 is occupied by "Franco American Chemical Company", a pharmaceutical manufacturer. Five buildings comprise the facility, including a distilling room, a filling, packing and shipping building, two storage buildings, and a boiler house.	Pharmaceutical Manufacturing	1909 Sanborn Map *Appendix K-2*
1917	An additional storage building has been constructed.	Pharmaceutical Manufacturing	1917 Sanborn Map *Appendix K-2*
1922	The Property appears similar to 1917, with a few building additions constructed.	Pharmaceutical Manufacturing	1922 Sanborn Map *Appendix K-3*
1924	Room 20 (Boiler House) is constructed in 1923. Buildings are also located in the areas of present-day Rooms 1, 2, 3, 22 and 24. "HS and LB Tanks" are located adjacent to Room 3 and are denoted as underground. Additional buildings are located to the south. A coal storage area is located to the north of the boiler house.	Pharmaceutical Manufacturing	1924 Historical Site Plan *Appendix K-1*
1933-1939	Buildings on Lot 10 are constructed, with the exception of Rooms 20 and 2.	Pharmaceutical Manufacturing	1949 Historical Site Plan *Appendix K-1*
1934	Ganes Chemicals, Inc. acquires Lot 10 from Franco-American Chemical Works.	Pharmaceutical Manufacturing	Chain of Title Report *Appendix A-3*
1940	The Property appears as previously described.	Pharmaceutical Manufacturing	1940 Aerial Photograph
1946	Buildings on Lot 10 appear similar to the present time, with the exception of Room 2. Tank and material storage areas are identified.	Pharmaceutical Manufacturing	1946 Historical Site Plan *Appendix K-1*
1949	Room 2 is constructed in 1948. Tank and material storage areas are identified.	Pharmaceutical Manufacturing	1949 Historical Site Plan *Appendix K-1*
1951	Lot 10 appears as previously described.	Pharmaceutical Manufacturing	1951 Aerial Photograph
1964	Lot 10 appears similar to the present. Tank areas are identified.	Pharmaceutical Manufacturing	1964 Historical Site Plan *Appendix K-1*
1968	"Ganes Chemical Wks." is identified as occupying Lot 10.	Pharmaceutical Manufacturing	1968 Sanborn Map *Appendix K-2*

GSFP - LOT 10, BLOCK 18			
Date	***Property Description***	***Operations/Use***	***Source***
1977	Lot 10 appears as previously described. Tank areas are identified.	Pharmaceutical Manufacturing	1977 Historical Site Plan *Appendix K-1*
1978	The Property appears as previously described. The outside drum storage and tank farm are visible.	Pharmaceutical Manufacturing	1978 Aerial Photograph
1981	Lot 10 appears as previously described. Tank areas are identified.	Pharmaceutical Manufacturing	1981 Historical Site Plan *Appendix K-1*
1987	The Property appears similar to the present time.	Pharmaceutical Manufacturing	1987 Aerial Photograph *Appendix K-3*
1995	The Property appears similar to the present time.	Pharmaceutical Manufacturing	1995 Aerial Photograph

ORCHARD STREET FACILITY PROPERTY (OSFP) (BLOCK 19, LOTS 9-11)

OSFP - LOT 9, BLOCK 19			
Date	***Property Description***	***Operations/Use***	***Source***
Prior to 1900	Lot 9 is owned by Geovanni Fillipelli.	Unknown	Chain of Title Report *Appendix A-3*
1909	Lot 9 is undeveloped.	Undeveloped	1909 Sanborn Map *Appendix K-2*
1917	Lot 9 appears the same as in the 1909 Sanborn Map.	Undeveloped	1917 Sanborn Map *Appendix K-2*
1922	Lot 9 is occupied by a residential dwelling and associated detached garage.	Residential	1922 Sanborn Map *Appendix K-2*
1927	Lot 9 is purchased by John Romanelli.	Residential	Chain of Title Report *Appendix A-3*
1946	Lot 9 appears the same as in the 1922 Sanborn Map.	Residential	1927 Historical Site Plan *Appendix K-1*
1949	Lot 9 appears the same as in the 1946 Historical Site Plan.	Residential	1949 Historical Site Plan *Appendix K-1*
1964	Lot 9 appears the same as in the 1949 Historical Site Plan.	Residential	1964 Historical Site Plan *Appendix K-1*
1967	Ganes Chemical Works, Inc. acquires Lot 9.	Residential	Chain of Title Report *Appendix A-3*
1968	Lot 9 appears the same as in the 1964 Historical Site Plan.	Residential	1968 Sanborn Map *Appendix K-2*
1987	The Property appears similar to the 1968 Sanborn Map and to the present time.	Residential	1987 Aerial Photograph *Appendix K-3*
1995	Lot 9 appears similar to the present time, occupied by a residential dwelling.	Residential	1995 Aerial Photograph

OSFP - LOT 10, BLOCK 19			
Date	*Property Description*	*Operations/Use*	*Source*
Prior to 1900	Moses Trubek acquired title to Lot 10.	Unknown	Chain of Title Report *Appendix A-3*
1909	Lot 10 is vacant.	Undeveloped	1909 Sanborn Map *Appendix K-2*
1917	Lot 10 is vacant.	Undeveloped	1917 Sanborn Map *Appendix K-2*
1922	A large structure is located on the Property in the area of present day Room 28 & 30.	Manufacturing	1922 Sanborn Map *Appendix K-2*
1924	A 32' x 46' structure and associated underground tank are located on Lot 10.	Manufacturing	1924 Historical Site Plan *Appendix K-1*
1940	Ganes Chemical Works, Inc. acquires Lot 10	Pharmaceutical Manufacturing	Chain of Title Report *Appendix A-3*
1940	The Property appears the same as in the 1924 Historical Site Plan.	Pharmaceutical Manufacturing	1940 Aerial Photograph
1946	Rooms 26, 27 and 28 are present, along with a warehouse located to the south. Areas of coal storage and carboy storage are also noted on Lot 10.	Pharmaceutical Manufacturing	1946 Historical Site Plan *Appendix K-1*
1949	Rooms 29 through 32 are constructed. Tank and material storage areas are identified.	Pharmaceutical Manufacturing	1949 Historical Site Plan *Appendix K-1*
1951	The Property appears the same as in the 1949 Historical Site Plan. The area located on the corner of Lincoln and Broad Streets is grassed. A potential drum storage area is observed near Rooms 29 and 31.	Pharmaceutical Manufacturing	1951 Aerial Photograph
1964	Lot 10 appears similar to the present. Tank areas are identified.	Pharmaceutical Manufacturing	1964 Historical Site Plan *Appendix K-1*
1968	"Auto Parking" on the southern portion of Lot 10 is noted.	Pharmaceutical Manufacturing	1968 Sanborn Map *Appendix K-2*
1977	The Property appears as previously described. Tank areas are identified.	Pharmaceutical Manufacturing	1977 Historical Site Plan *Appendix K-1*
1978	The Property appears as previously described. Stored materials are observed on concrete pad near Rooms 29 and 31.	Pharmaceutical Manufacturing	1978 Aerial Photograph
1981	The Property appears as previously described. Tank areas are identified.	Pharmaceutical Manufacturing	1981 Historical Site Plan *Appendix K-1*
1987	The Property appears similar to the present time.	Pharmaceutical Manufacturing	1987 Aerial Photograph *Appendix K-3*
1995	The Property appears similar to the present time.	Pharmaceutical Manufacturing	1995 Aerial Photograph

OSFP - LOT 11, BLOCK 19			
Date	***Property Description***	***Operations/Use***	***Source***
Prior to 1900	Lot 11 is owned by Henry Hammond.	Unknown	Chain of Title Report *Appendix A-3*
1909	Lot 11 is vacant.	Undeveloped	1909 Sanborn Map *Appendix K-2*
1917	Lot 11 is vacant.	Undeveloped	1917 Sanborn Map *Appendix K-2*
1922	Lot 11 is occupied by a small structure (possibly a garage).	Garage/Shed	1922 Sanborn Map *Appendix K-2*
1945	Lot 11 is purchased by Kathleen Duenzle.	Garage/Shed	Chain of Title Report *Appendix A-3*
1946	Lot 11 is occupied by a residential dwelling and associated detached garage.	Residential	1946 Historical Site Plan *Appendix K-1*
1949	Lot 11 appears the same as in the 1946 Historical Site Plan.	Residential	1949 Historical Site Plan *Appendix K-1*
1951	Lot 11 appears the same as in the 1949 Historical Site Plan.	Residential	1951 Aerial Photograph
1952	Lot 11 is purchased by Leonard Pati.	Residential	Chain of Title Report *Appendix A-3*
1964	Lot 11 appears the same as in the 1951 Aerial Photograph.	Residential	1964 Historical Site Plan *Appendix K-1*
1968	Lot 11 appears the same as in the 1964 Historical Site Plan.	Residential	1968 Sanborn Map *Appendix K-2*
1977	Lot 11 appears the same as in the 1968 Sanborn Map.	Residential	1977 Historical Site Plan *Appendix K-1*
1978	Lot 11 appears the same as in the 1977 Historical Site Plan.	Residential	1978 Aerial Photograph
1981	Lot 11 is purchased by Anthony Rinaldi.	Residential	Chain of Title Report *Appendix A-3*
1987	Lot 11 appears the same as in the 1978 Aerial Photograph.	Residential	1987 Aerial Photograph *Appendix K-3*
1988	Lot 11 is purchased by Sharon Rinaldi.	Residential	Chain of Title Report *Appendix A-3*
1989	Ganes Chemicals, Inc. purchase Lot 11.	Residential	Chain of Title Report *Appendix A-3*
1995	The Property appears similar to the present time, occupied by a residential dwelling.	Residential	1995 Aerial Photograph

GARDEN STREET WAREHOUSE PROPERTY (GSWP) (BLOCK 2, LOT 8)

GSWP - LOT 8, BLOCK 2			
Date	***Property Description***	***Operations/Use***	***Source***
Pre 1900s	Lot 8 is owned by Michael Ollert.	Unknown	Chain of Title Report *Appendix A-3*
1909	The majority of Lot 8 appears to be undeveloped with the exception of the northeastern corner, which is occupied by ball fields and bleachers.	Undeveloped & Ball Fields	1909 Sanborn Map *Appendix K-2*
1917	Lot 8 appears undeveloped. The ball fields observed in the 1909 Sanborn Map, are no longer present.	Undeveloped	1917 Sanborn Map *Appendix K-2*
1922	Lot 8 appears similar to that of the 1917 Sanborn Map.	Undeveloped	1922 Sanborn Map *Appendix K-2*
1933	Lot 8 is purchased by William T. Muehling.	Undeveloped	Chain of Title Report *Appendix A-3*
1940	Lot 8 appears undeveloped.	Undeveloped	1940 Aerial Photograph
1946	Lot 8 appears undeveloped.	Undeveloped	1946 Historical Site Plan *Appendix K-1*
1947	Ganes Chemical Works, Inc. purchases Lot 8.	Undeveloped	Chain of Title Report *Appendix A-3*
1949	Lot 8 is occupied by pump house (production well #5) located on the northwestern corner of the lot and a 60' x 75' building (warehouse) located on the southeastern corner of the lot (present day warehouse).	Material Storage and Warehouse	1949 Historical Site Plan *Appendix K-1*
1951	The lot appears undeveloped (the pump house and warehouse are not noted).	Discrepancy	1951 Sanborn Map
1964	Lot 8 is occupied by the Warehouse, Sodium Storage Building and Pump House (production well #5). An outside material storage area (empty drums, carboys, muriatic acid in carboys, staging of residue in drums and formice) and underground tank area are also identified.	Material Storage & Warehousing	1964 Historical Site Plan *Appendix K-1*
1968	"Ganes Chem. Wks." is noted as occupying the warehouse.	Material Storage & Warehousing	1968 Sanborn Map *Appendix K-2*
1971	Lot 8 appears as previously described. Materials storage is observed on the outside material storage area.	Material Storage & Warehousing	1971 Aerial Photograph
1977	Lot 8 appears as previously described in the 1971 Aerial Photograph.	Material Storage & Warehousing	1977 Historical Site Plan *Appendix K-1*
1978	Lot 8 appears as previously described. Drum storage on a concrete pad is observed. Piles of fill are also observed on the northeastern portion of the Property (outside material storage area).	Material Storage & Warehousing	1978 Aerial Photograph
1981	Lot 8 appears as previously described.	Material Storage & Warehousing	1981 Historical Site Plan *Appendix K-1*
1987	Lot 8 appears as previously described.	Material Storage & Warehousing	1987 Aerial Photograph *Appendix K-3*

GSWP - LOT 8, BLOCK 2			
Date	*Property Description*	*Operations/Use*	*Source*
1995	The Property appears similar to the present time. Drum storage is observed in the northeast corner of the Property.	Material Storage & Warehousing	1995 Aerial Photograph

SCHARG WAREHOUSE PROPERTY (SWP) (Block 23, Lots 1, 1A, 1B and 2)

SWP - [1]LOT 1, 1A, & 1B, BLOCK 23			
Date	*Property Description*	*Operations/Use*	*Source*
Pre-1900's	Lot 1 is owned by Maria Schreiber. A portion of Lot 1 owned by George Zimmerman. A portion of Lot 1 owned by George Fleidel. A portion of Lot 1 owned by Wilhelmina Steinle.	Residential and Undeveloped	Chain of Title Report *Appendix A-3*
1892	Lot 1 purchased by John Keller.	Residential and Undeveloped	Chain of Title Report *Appendix A-3*
1902	The "Scharg Bros. Silk Factory" occupies the western portion of Lot 1. The eastern-most end of the present-day facility and small warehouse are noted.	Silk Manufacturing	1902 Sanborn Map *Appendix K-2*
1903	Lot 1 purchased by Marie Vitous	Residential	Chain of Title Report *Appendix A-3*
1904	Erdman E. Scharg and Christof Scharg purchase portions of Lot 1 from George Zimmerman and George Fleidel.	Residential and Undeveloped	Chain of Title Report *Appendix A-3*
1909	A building addition has been constructed on the western-most end of the Scharg factory and small warehouse. Two (2) residential dwellings are located along Garden Street.	Silk Manufacturing and Residential	1909 Sanborn Map *Appendix K-2*
1917	A building addition has been constructed on the southern end extending to the east of the Scharg factory that now appears as present time. Three residential dwelling are located on the lot, one along Broad Street and two along Garden.	Silk Manufacturing and Residential	1917 Sanborn Map *Appendix K-2*
1922	The Property appears the same as in the 1917 Sanborn Map.	Silk Manufacturing and Residential	1922 Sanborn Map *Appendix K-2*
1940	Lot 1 appears the same as in the 1922 Sanborn Map. Portions of the Property unoccupied by buildings are grassed.	Silk Manufacturing and Residential	1940 Aerial Photograph
1947	A portion of Lot 1 is purchased by Erdman E. Scharg and Christof Scharg from Wilhelmina Steinle.	Residential	Chain of Title Report *Appendix A-3*
1951	The Property appears the same as in the 1922 Sanborn Map.	Silk Manufacturing and Residential	1951 Sanborn Map *Appendix K-2*
1951	The Property appears the same as in the 1940 Aerial Photograph.	Silk Manufacturing and Residential	1951 Aerial Photograph
1960	Lot 1 undergoes forclosure (Maria Vitous) and is purchased by Carl Zeidler then purchased by Scharg Brother, Inc.	Residential	Chain of Title Report *Appendix A-3*

SWP - [1]LOT 1, 1A, & 1B, BLOCK 23			
Date	***Property Description***	***Operations/Use***	***Source***
1968	Lot 1 appears the same as in the 1951 Sanborn Map. A repair shop has been constructed onto the southwest end of the boiler house. Property building identified as the Scharg Bros. Silk Mill.	Silk Manufacturing and Residential	1968 Sanborn Map *Appendix K-2*
1971	The Property appears as previously described. The eastern portion of the Property is newly wooded.	Silk Manufacturing and Residential	1971 Aerial Photograph
1978	Lot 1 is purchased by Ganes Chemcials, Inc. The Property appears as previously described. The entire eastern end of the Property is wooded.	Storage and Residential	Chain of Title Report *Appendix A-3* 1978 Aerial Photograph
1987	Ganes constructs their corporate office building. The remainder of the property appears similar to the present time.	Storage & Corporate Office	1987 Aerial Photograph *Appendix K-3*
1995	The Property appears similar to the present time.	Storage & Corporate Office	1995 Aerial Photograph

Note:
[1]Due to lack of quality assessment maps which depict the lot (sublot) boundaries, Lots 1, 1A, and 1B are described together.

SWP - LOT 2, BLOCK 23			
Date	***Property Description***	***Operations/Use***	***Source***
Pre-1900's	Lot 2 is owned by Mary Fill and Husband.	Unknown	Chain of Title Report *Appendix A-3*
1902	Lot 2 is occupied by a residential dwelling	Residential	1902 Sanborn Map *Appendix K-2*
1917	Lot 2 appears the same as in the 1902 Sanborn Map.	Residential	1917 Sanborn Map *Appendix K-2*
1922	Lot 2 appears the same as in the 1917 Sanborn Map.	Residential	1922 Sanborn Map *Appendix K-2*
1931	Lot 2 is purchased by Arthur Fill and Chaterine Fill.	Residential	Chain of Title Report *Appendix A-3*
1946	Lot 2 appears the same as in the 1922 Sanborn Map.	Residential	1946 Historical Site Plan *Appendix K-1*
1949	Lot 2 appears the same as in the 1946 Historical Site Plan.	Residential	1949 Historical Site Plan *Appendix K-1*
1951	Lot 2 appears the same as in the 1949 Historical Site Plan.	Residential	1949 Historical Site Plan *Appendix K-1*
1964	Lot 2 appears the same as in the 1951 Historical Site Plan.	Residential	1964 Historical Site Plan *Appendix K-1*
1967	Lot 2 is purchased by Louis Van Hentenryck.	Residential	Chain of Title Report *Appendix A-3*
1968	Lot 2 appears the same as in the 1964 Historical Site Plan.	Residential	1968 Sanborn Map *Appendix K-2*
1972	Lot 2 is purchased by Ann Van Hentenryck.	Residential	Chain of Title Report *Appendix A-3*
1978	Lot 2 is purchased by Eckert and Joanne Eckert.	Residential	Chain of Title Report *Appendix A-3*

SWP - LOT 2, BLOCK 23			
Date	*Property Description*	*Operations/Use*	*Source*
1998	Lot 2 is purchased by Ganes Chemicals, Inc. and the residential home removed. Lot 2 is currently vacant and undeveloped.	Residential & Undeveloped	Chain of Title Report *Appendix A-3*

SUMMARY OF HISTORICAL INFORMATION

GARDEN STREET FACILITY PROPERTY (GSFP) (BLOCK 18, LOTS 6-10)

Block 18 is located on the northeast corner of the Broad and Garden Streets intersection. Block 18 is bordered to the north by Garden Street (238 feet), to the south by Orchard Street (257 feet), to the west by Broad Street (184 feet) and to the east by residential dwellings and a commercial building (204 feet). Block 18 includes Lots 6 through 10 and comprises a total of approximately 2 acres. A description of each lot is provided below:

- **Block 18, Lot 6:** Information obtained for Lot 6 dates back to 1909. This information indicates that Lot 6 was occupied by a residential dwelling from 1909 until 1987. In 1987, Ganes Chemicals converted the lot into a gravel parking area. Lot 6 is comprised of 10,019 square feet of land space or 0.23 acres and is currently undeveloped and used as a parking lot.

- **Block 18, Lot 7:** Information obtained for Lot 7 dates back to pre-1900. The first known structure observed on Lot 7 appeared to be a small shed likely associated with a residential dwelling. In 1946 a residential dwelling was constructed on the lot. Ganes Chemicals purchased the lot and residential dwelling in 1966. The residential dwelling is presently located on the site. Lot 7 is comprised of 12,632 square feet of land space or 0.29 acres and is currently and historically has been occupied by a residential dwelling and associated garage.

- **Block 18, Lot 8:** Information obtained for Lot 8 dates back to pre-1900. The information indicates that Lot 8 was occupied by a residential dwelling from 1909 until 1998. Ganes Chemicals purchased Lot 8 in 1981. In 1989 Ganes Chemicals constructed their Quality Control Lab on the northwestern corner of the lot. Ganes proceeded to remove the residential dwelling in1998 and convert that portion of the lot into a parking area. Lot 8 is comprised of 9,583 square feet of land space or 0.22 acres and is currently occupied by the Quality Control Lab, grassy areas, an outdoor cabana eating area and gravel parking area.

- **Block 18, Lot 9:** Information obtained for Lot 9 dates back to pre-1900. The information indicates that the lot was vacant/undeveloped until the 1910's at which time a residential dwelling was constructed. Ganes Chemicals purchased Lot 9 in 1960. In 1981, Ganes removed the residential dwelling and constructed a Research and Development (R&D) Center. Lot 9 is comprised of 11,021 square feet of land space or 0.253 acres and is currently occupied by the R&D Center (4,446 square feet) and a storage shed (historically associated with the former residential dwelling) that is currently used to store winter snow removal equipment. The R& D Center was vacated in late 1999. Currently, Novus Fine Chemicals, Inc. the new property owner is in the process of converting the R&D Center into an office building.

- **Block 18, Lot 10:** Information obtained for Lot 10 dates back to 1894. According to the information, Lot 10 has historically been utilized for manufacturing since prior to 1894. Prior to 1909, the Trubeck Chemical Works acquired portions of Lot 10 which, in 1909, became the Franco American Chemical Company. Five building structures were observed on the lot at that time. Subsequently, the property underwent several construction phases involving the addition of buildings. In 1934, Lot 10 was purchased by Ganes Chemicals and by 1946, the general building layout currently observed was established. Lot 10 is comprises 47,916 square feet of land space or 1.1 acres and primarily consists of the main manufacturing area of the property (15,085 square feet of building improvements).

ORCHARD STREET FACILITY PROPERTY (OSFP) (BLOCK 19, LOTS 9-11)

Block 19 is located on the southeast corner of the Broad and Orchard Streets intersection and South of Block 18. Block 19 is bordered to the north by Orchard Street (137 feet), to the south by Lincoln Street (137 feet), to the west by Broad Street (151 feet) and to the east by residential dwellings (155 feet). Block 19 includes Lots 9 through 11 and comprises a total of approximately 0.66 acres. A description of each lot is provided below:

- **Block 19, Lot 9:** Information obtained for Lot 9 dates back to pre-1900. This information indicates that Lot 9 was vacant/undeveloped until the early 1920's at which time a residential dwelling was constructed. Ganes Chemicals purchased the lot and residential dwelling in 1967. The residential dwelling is still present on the lot. Lot 9 is comprised of 5,009 square feet of land space or 0.11 acres and is currently and was historically occupied by a residential dwelling and associated detached garage.

- **Block 19, Lot 10:** Information obtained for Lot 10 dates back to pre-1900. According to the information, Lot 10 was vacant/undeveloped until the early 1920's and has since been utilized for manufacturing. In 1922, a single structure was located on the lot associated with the Franco American Works. Ganes Chemicals purchased the lot in 1940 and by 1949, the seven buildings (six of which are interconnected) presently on the site were constructed. Lot 10 comprises 20,952 square feet of land space or 0.48 acres and primarily consists of the secondary manufacturing area of the property encompassing 30,871 square feet of building improvements.

- **Block 19, Lot 11:** Information obtained for Lot 11 dates back to pre-1900. The first known structure observed on Lot 11 appeared to be a small shed likely associated with a residential dwelling. In 1946 a residential dwelling was constructed on the lot, Ganes Chemicals purchase the lot in 1987 and the residential dwelling is still located on the lot. Lot 11 is comprised of 3,006 square feet of land space or 0.07 acres.

GARDEN STREET WAREHOUSE PROPERTY (GSWP) (BLOCK 2, LOT 8)

- **Block 2, Lot 8:** Block 2, Lot 8 is located on the northwest side of Garden Street. Information obtained for Block 2, Lot 8 dates back to pre-1900. The majority of the block was vacant with the exception of some bleachers for a ball field located on the most easterly portion of the lot until 1947 at which time, Ganes Chemicals purchased the block. Ganes proceeded to install a production well and construct the present day material storage warehouse, outside drum storage pad and empty drum storage area. Block 2, Lot 8 is comprised of 57,499 square feet of land space or 1.32 acres and is improved with 9,967 square feet of building space.

SCHARG WAREHOUSE PROPERTY (SWP) (BLOCK 23, LOTS 1, 1A, 1B, & 2)

Block 23 is located south of the Broad and Garden Streets intersection. Block 23 is bounded to the north by Garden Street, to the south by Lincoln Street, to the west by Hoboken Road, and to the east by Broad Street. Block 23 is currently occupied by Ganes Chemicals corporate office building, former Scharg Warehouse (current Ganes storage), and an emergency equipment storage shed. Historically, Block 23 was also occupied by four residential dwellings. Due to the lack of quality tax assessor maps and title deed documents, the boundaries were not determined between lots 1, 1A, and 1B and therefore they are all described as Lot 1.

- **Block 23, Lot 1:** Information obtained for Lot 11 dates back to pre-1900. The Scharg Bros. Silk Factory was constructed before 1902. Three residential dwelling were also located on Lot 1, which since been removed. Ganes purchased Lot 1 in 1978 and the Scharg Warehouse was used as a storage area for used equipment and empty carboys. In 1987, Ganes also constructed their corporate office building on the northwest corner of Lot 1. Lot 1 is comprised of 162,305 square feet of land space or 3.72 acres and is currently occupied by the former Scharg Brothers Silk Mill, Ganes corporate office and a emergency equipment shed.

- **Block 23, Lot 2:** Lot 2 has historically been occupied by a residential dwelling from 1902 until 1998 at which time Ganes purchased the lot and removed the residential dwelling. Lot 2 is comprised of 5,184 square feet of land space or 0.119 acres and is currently vacant/undeveloped.

APPENDIX B-2

DESCRIPTION OF CURRENT AND HISTORICAL OPERATIONS

APPENDIX B-2
DESCRIPTIONS OF CURRENT AND HISTORICAL OPERATIONS

The following sections provide descriptions of current and historical operations conducted at the property.

Site-wide Overview of Historical and Current Operations
Historical operations (prior to the 1950's) were primarily conducted on the Garden Street Facility Property (GSFP) (Block 18, Lot 10) and the Orchard Street Facility Property (OSFP) (Block 19, Lot 10). Information pertaining to specific procedures (i.e., process flow charts, batch report logs, and standard operating procedures, etc.) were not available for review. An interpretation of historical operating procedures was conducted by review of historical site plans (Appendix K-1), Sanborn Maps (Appendix K-2) and interviews with knowledgeable employees.

Current and historical operations at the property primarily consisted of the manufacturing of fine chemicals and intermediates for pharmaceutical industries. Raw process materials were processed via halogenation, reductive amination, diazotization, metallic sodium reactions, esterifications, alkylations, hydrogenations, condensation reactions, reductions, oxidations, etc., into a powder form designated by the pharmaceutical industry (client). It appears based on review of available data, that all three former occupants (Trubek Chemical Works, Inc. (Trubek), Franco-American Chemical Works (Franco-American) and Ganes Chemicals) have conducted similar operations/process at the property.

Trubek Chemical Works, Inc. (Trubek) was the original operator at the GSFP. Trubek changed its name to Franco-American Chemical Works (Franco-American) in 1909 and operated at the GSFP and OSFP until 1934. Ganes Chemical Works, Inc. (Ganes) took over operation in 1934. According to the 1924 site plan, Franco-American operated out of approximately eight buildings on the GSFP including a distilling room, filling packing and shipping office, boiler house and associated coal storage bin, and four buildings of unknown operations and one building on the OSFP of unknown operations. Location in comparison to present day rooms is provided in the following table. It appears that Franco-American's main operations were conducted from the distilling room. By 1946, under the operation of Ganes, the GSFP building layout appeared as it does today and by 1949, the ORSF building layout appeared as it does today.

Manufacturing operations were primarily conducted at the GSFP and OSFP and include chemical processes such as halogenation, reductive amination, diazotization, metallic sodium reactions, esterifications, alkylations, hydrogenations, condensation reactions, reductions, oxidations, etc. In addition to chemical processing, the GSFP also has warehousing, research and development, analytical and pilot plant work capabilities.

All chemical processing areas are located on the GSFP and OSFP. In general, raw materials are used in the manufacture of pharmaceutical end-products using batch processing production techniques. All materials are typically brought in to a given processing room in a discrete container (i.e. drum, tote) and processed using a number of the chemical processes identified above according to specific "recipes" for a given product batch. Several vessels are used in the manufacture of each product. Equipment utilized on-site may include reaction vessels, crystallizers, distillers, dryers, autoclaves, centrifuges, and/or evaporators. Strict adherence to the "recipe" and to quality control procedures is documented on Batch Log Records (BLR's).

Following completion of the final product, finished products were stored at the OSFP for shipment to clients. Raw materials and finished products were transported between the GSFP and OSFP via forklift vehicles or by cart.

In the early 1960's, Ganes constructed the present day Garden Street Warehouse (GSW) on the Garden Street Warehouse Property (GSWP) (Block 2, Lot 8) for delivery and storage of all raw and in-process materials. Depending on the container and/or raw materials, materials were stored either inside the GSW or outside on the drum storage pad. Also utilized at the GSWP was a sodium storage building and empty drum storage pad. Raw materials being delivered to the GSFP or OSFP from the GSWP for manufacturing were delivered via forklift vehicle either through the main gate along Garden Street or the gate along Orchard Street.

Following acquisition of Block 23 by Ganes, the Scharg Warehouse Property (SWP) served as a storage area for outdated equipment, office furniture, facility records and empty cardboard drums. In the early 1980's Ganes constructed their Corporate Office building on Block 23. Reportedly, no manufacturing operations have been conducted on the SWP during Ganes' occupation.

The following is a description of current and historical operations conducted at the property outlined by parcel block and lot.

GARDEN STREET FACILITY PROPERTY (GSFP) (BLOCK 18, LOTS 6-10)

The following is a summary by parcel lot of current and historical operations conducted at the GSFP.

Block 18, Lot 6

Historical ownership information was not available through a chain-of-title search as documented in Appendix A-1. However, information was obtained through review of available historical site plans, Sanborn maps and aerial photographs that confirms Lot 6 was historically occupied by a residential dwelling from 1909 until the 1980's. During the 1980's, Ganes Chemicals removed/demolished the residential dwelling and converted the lot into a paved parking area. Based on available information, no manufacturing operations have been conducted on Lot 6.

Block 18, Lot 7

Lot 7 was historically occupied by residential structures and utilized as a residential dwelling (shed/house) prior to 1900 until the present time. In 1966, Ganes Chemicals purchased the lot. Based on available information, no manufacturing operations have been conducted on Lot 7.

Block 18, Lot 8
Lot 8 was historically occupied by residential structures (shed/dwelling) from 1909 until 1998. In 1981, Ganes Chemicals purchased the lot and in 1989 constructed a Quality Control Lab. Also in 1998 the residential dwelling was removed/demolished and the area converted into a gravel parking lot. A description operations conducted at the Quality Control Lab is provided below:

> *Quality Control Lab* - The Quality Control Lab has been in operation since 1989 and used for conducting high proficiency liquid chromatography (HPLC), gas chromatography, and wet chemistry using basic solvents (i.e. acetonitrile, 5% tri-ethylamene (TEA), methanol, IPA, and acetic acid). Since its construction, all wastewater generated at the building has been discharged to the Bergen County Utility Authority. The Quality Control Lab also contains office space and basement used for storing office supplies and office equipment.

Block 18, Lot 9
Lot 9 was historically occupied by residential structures (shed/dwelling) from prior to 1920 until 1981. In 1960, Ganes Chemicals purchased the lot and in 1981 removed/demolished the residential dwelling and constructed a Research and Development Center (R&D Center). In 1999, operations at the R&D Center ceased and the building is currently under renovation as office space associated with the new owners of Blocks 18 & 19. A description of historical operations conducted at the R&D Center is provided below:

> *Research and Development Center* - The Research and Development ("R&D") Center was in operation from 1981 until 1999. The R&D Center was used for experimentation, product development and product trouble shooting. A wide variety of chemicals were utilized at the R&D Center since its construction and all wastewater generated at the building has been discharged to the Bergen County Utility Authority.

Block 18, Lot 10
Lot 10 of Block 18 is comprised of the main manufacturing area and has been in operation since 1894. Previous occupants/owners were the Trubek Chemical Works and the Franco-American Chemical Company. Ganes purchased Lot 10 in 1934 and by 1946 the general building layout currently observed on the lot was established.

Current and historical operations at the GSFP primarily consisted of the manufacturing of fine chemicals and intermediates for pharmaceutical industries. The GSFP currently and has historically been utilized as the main manufacturing area of the property. Raw process materials were historically delivered to the GSFP from storage rooms located at the OSFP (Block 18) and more recently (1960's) from the GSWP. Raw materials were transported to the GSFP via forklift vehicles or carts through either the Garden Street gate entrance or the Orchard Street entrance. Once in the GSFP, raw materials were stored in numerous locations and rooms both historically and currently. Also, some raw materials were stored in bulk underground and aboveground storage tanks. The GSFP maintains fourteen manufacturing rooms, three laboratory rooms, two utility rooms, a maintenance room, a storeroom, and a lunch room.

Historic raw material stock included but was not limited too; sodium cyanide, alcohol, methanol, benzol, toluene, sulfuric & muriatic acids, metallic sodium, acetic acid, formic acid, sodium hydrosulfite, sulphur dioxide, soda ash, methyl ethyl ketone, ethylene diamine and mono methyl amine. Products produced historically included phenobarbital, barbital, cyclopal, pentobarbital, theophylline and aminophylline.

Manufacturing operations include chemical processes such as halogenation, reductive amination, diazotization, metallic sodium reactions, esterifications, alkylations, hydrogenations, condensation reactions, reductions, oxidations, etc. In addition to chemical processing, the GSFP also has warehousing, research and development, analytical and pilot plant work capabilities.

All chemical processing areas are located on the GSFP and OSFP. In general, raw materials are used in the manufacture of pharmaceutical end-products using batch processing production techniques. All materials are typically brought in to a given processing room in a discrete container (i.e. drum, tote) and processed using a number of the chemical processes identified above according to specific "recipes" for a given product batch. Several vessels are used in the manufacture of each product. Equipment utilized on-site may include reaction vessels, crystallizers, distillers, dryers, autoclaves, centrifuges, and/or evaporators. Strict adherence to the "recipe" and to quality control procedures is documented on BLR's.

Historical plant operation practices have followed similar BLR's for all end products. According to plant operations personnel, a given product could have been processed in almost any of the processing rooms on-site. Therefore, tracking of a specific raw material or end product by room location is not practical for this site.

Chemical processing at this facility is typically conducted in a series of processing vessels. These vessels are classified on-site as: tanks, kettles, drop tanks, centrifuges, condensers, vacuum pumps, packed scrubbers, venturi scrubbers, pressure filters, marmites, knock-out tanks, fitz mills, shakers, vacuum blenders, sumps, or other site specific terminology. All materials and products are typically transferred by drums or by manual pumping under an operator's care according to the specific BLR. However, product and raw material transfer lines are present at the facility. Material transfer operations and associated environmental concern will be further discussed in Appendix E.

The following is a description of current and historic operations conducted within buildings/Rooms of the GSFP from 1946 to the present. Building construction dates were obtained from 1946 and 1949 Gane's Chemicals Works, Inc. Historical Site Maps.

ROOM ID	HISTORICAL ID	DESCRIPTION OF CURRENT AND HISTORICAL OPERATIONS
1	A	Pre-1909 – Room 1(A) constructed by the Franco-American Chemical Company and utilized as a distilling room (manufacturing). 1909 to Pre-1946 - Distilling room (The Franco-American Chemical Works). 1935 – Current Room 1 constructed (size 25' x 63'). 1946 to 1949 – Manufacturing of esters (also part of current Room 2). 1949 to 1964 – Manufacturing of esters. Recent history – Dedicated manufacturing of phenylephrine (decongestant). Current – Has been renovated for raw material storage (historically conducted at the GSW).
2	B	Pre-1909 – Room 2(B) constructed by the Franco-American Chemical Co. and utilized for filling, packing, shipping & office building and a portion of the distilling room. 1946 – Office, shed, part of room 1(A) (crystallization of drugs). 1948 – Current room 2 constructed (size 46' x 40' x 53') formerly part of office building, shed, and distilling room associated with the Franco-American Chemical Co. 1949 to 1981 – Room 2 utilized for the storage of process kettles and distillation still. Current: Multi use manufacturing • Pseudoephedrin (occasional), Phenylephrine, Venalfaxine, • Distillation capabilities.
3	C	Pre-1922 – Room 3/C constructed as part of distilling room associated with the Franco-American Chemical Co. 1938 – Current Room 3/C constructed (size 23' x 29') formerly part of distilling room. Pre-1946 to Recent History – Dissolving of metallic sodium in alcohol. Current – Dedicated drying of: • Pseudoephedrin Hydrochloride & Pseudoephedrin Bisulfate
4	I	1934 – Current Room 4(I) constructed (size 27' x 28'). 1934 to 1946 – Unknown. 1946 to 1977 – Manufacturing of crude pentobarbital. Recent History - Multi use manufacturing of Venalfaxine (anti-depressant). Current – Idle
5	K	1934 – Current Room 5(K) constructed (size 39' x 29'). 1934 to 1946 – Unknown, possibly manufacturing of esters. 1946 to 1977 – Manufacturing of esters. 1977 – Stills. Recent History – Dedicated manufacturing for Phenylephrine (decongestant), Toluene and MIBK Stripping. Current – Idle.
6	L	1934 – Current Room 6(L) constructed (size 26' x 29'). 1934 to 1946 – Unknown, possibly drying of Theophyline & experimenting. 1946 to 1949 – Drying of Theophylline & experimenting. 1949 to 1977 – Manufacturing of amino-phylline. 1977 to 1981 – Mill blending. Recent History – Dryer room for numerous products. Current – Idle.

APPENDIX B-2
Descriptions of Current and Historical Operations

Room ID	Historical ID	Description of Current and Historical Operations
7	E	1938 – Current Room 7(E) constructed (size 33' x 62'). 1938 to 1946 – Unknown, possibly the manufacturing cyanacetic acid & intermediates for theophylline 1946 to Recent -Manufacturing of cyanacetic acid and intermediates for theophylline and benzocaine. Recent History – Multi use manufacturing of: • Pseudoephedrin Hydrochloride & Pseudoephedrin Bisulfate.
8	J	1935 – Current Room 8(J) constructed (size 33' x 48'). 1935 to Recent History - Esters & drying of sodium barbitals. Most Recent History - Dedicated for manufacturing of phenylephrine and multi-use for the manufacturing of venalfaxine & methohexital. Current – Idle.
9	H	1935 – Current Room 9(H) constructed (size 35' x 59'). 1935 to Recent History – Manufacturing of theophyline. Current – Manufacturing, Predominate use of toluene. • Pseudoephedrin Hydrochloride & Pseudoephedrin Bisulfate.
10	R	Pre-1922 – Building associated with the Franco-American Chemical Works constructed in the area of current Room 10/R (size 24' x 35'). Building use is unknown. 1936 – Current Room 10 constructed (size 32' x 24'). 1936 to Current – Room 10 operated as a repair (maintenance) and plumbing shop.
11	Q	Pre-1922 – A portion of a building associated with the Franco-American Chemical Works constructed in the area of current Room 11 (size 24' x 35'). Use of the building is unknown. 1936 – Current Room 11(Q) constructed. 1936 to Pre-1949 – Storage of metallic sodium in drums. 1949 to Pre-1977 - Laboratory and storage of laboratory maintenance supplies. 1977 to Recent – Pilot plant. Current – Equipment storage.
12	P	1936 – Current Room 12(P) constructed (size 22' x 24'). 1936 to Post-1981 – Laboratory. Current – Office space.
13	O	1936 – Current Room 13(O) constructed (size 23' x 24'). 1936 to Post-1981 – Laboratory. Recent History – Laboratory. Current – Idle.
14	N	1936 – Current Room 14(N) constructed (size 24' x 24'). 1936 to Post-1981 – Laboratory. Current – Laboratory.
15	M	1936 – Current Room 15(M) constructed (size 33' x 25'). 1936 to Current – Lockerroom, restrooms, and lunchroom.
17	U (first floor)	Pre-1946 – Former location of building associated with the Franco-American Chemical Works and coal storage. 1939 – Current Room 17(U&W) constructed (size 62' x 27'). 1939 to Post-1981 – Manufacturing of ethyl bromide, esters and crude barbituates. 1981 to Current – Pilot lab.
	W (basement)	Pre-1946 – Former location of building associated with the Franco-American Chemical Works and coal storage. 1939 – Current Room 17(U&W) constructed (size 62' x 27'). 1939 to Current – Storage of light machinery, machine oil, drums of dimethyl urea and empty containers.

ROOM ID	HISTORICAL ID	DESCRIPTION OF CURRENT AND HISTORICAL OPERATIONS
18	V	Pre-1946 – Former location of building associated with the Franco-American Chemical Works and coal storage. 1939 – Current Room 18(V) constructed (size 15' x 27'). 1939 to 1985 – Dissolving sodium in alcohol (sodium methylation). Current – Storage.
Canopy	N/AP	Pre-1946 – Canopy constructed. Pre-1946 to Recent - Storage of diethyl sulphate in drums & manufacturing of cyanoacetic acid. Current – Location of 6,000-gallon propylene glycol AST/process chillers.
20	S	Pre-1909 – Room 20(S) constructed (size 42' x 25' & 36' x 31'). Pre-1909 to Recent History – Boiler House & manufacturing and equipment. Current – Boiler House.
21	S	Pre-1909 – Room 21(S) constructed as part of Room 20. Pre-1909 - Utility room & pump house.
22	G & F	Pre-1922 – Room 22(G&F) constructed (size 25' x 10') Pre-1922 to Recent – Storage of machine oil in drums, old machinery, & compressors. Current – Compressor Room (3).
24	D	Pre-1909 – Location of former distilling room associated with the Franco-American Chemical works. 1935 – Current Room 24(D) constructed (size 26' x 40'). 1935 to Pre-1949 – Manufacturing of barbituates. 1949 to Post-1981 – Crystallization of theophylline. Recent History – Multi-use manufacturing of venalfaxine and methohexital, dimen hydriate Current – Idle.
25	X	Pre-1924 – Room 25(X) constructed (size 20' x 14'). Pre-1924 to 1985 – Manufacturing of theophyline. Current – Storage.
33	N/AP	Pre-1924 – Location of former building associated with the Franco-American Chemical Works (size 38' x 26'). Pre-1946 to Pre-1964 – Ice House. Pre-1964 to Pre-1977 – Shed. Pre-1977 to Pre-1981 – Storage of Hydrochloric acid in carboys on roof Pre-1981 to Current – Predominate manufacturing of: • Pseudoephedrin Hydrochloride & Pseudoephedrin Bisulfate

ORCHARD STREET FACILITY PROPERTY (OSFP) (BLOCK 19, LOTS 9-11)

The following is a summary by parcel block and lot of current and historical operations conducted at the OSFP.

Block 19, Lot 9

Lot 9 was vacant/undeveloped until the early 1920's at which time a residential dwelling was constructed. Ganes Chemicals purchased the lot and associated residential dwelling in 1967. The residential dwelling is still located on the lot. Based on available information, no manufacturing operations have been conducted on Lot 9.

Block 19, Lot 11
The first known structure observed on Lot 11 appeared to be a small shed likely associated with a nearby residential dwelling. In 1946, a residential dwelling was constructed on the lot. In 1987, Ganes Chemicals purchased the lot and the residential dwelling is still presently located on the lot. Based on available information, no manufacturing operations have been conducted on Lot 9.

Block 19, Lot 10
Lot 10 of the OSFP was vacant and undeveloped until the early 1920's. In 1922, a single structure was located on the lot which was owned and operated by Franco American Works. No information regarding historical operations conducted within the building located on Lot 10 was available. Ganes Chemicals purchased the lot in 1940 and by 1946 a storehouse and packaging building, a warehouse building and an office/manufacturing building were constructed. By 1949, the layout of Lot 10 reflected that of today and consisted of seven buildings/Rooms (six of which are interconnected).

Operations conducted at the OSFP primarily consisted the storage of raw materials and finished stock in Rooms 28, 30, and 32. The manufacturing of fine chemicals and intermediates was historically and currently conducted in Rooms 26, 27, 29, and 31. Office space and storage was also conducted in a portion of Room 26.

The OSFP currently and has historically been utilized as the secondary manufacturing area of the property. Raw process material storage was historically conducted on the OSFP until construction of the GSW in the 1960's. Raw materials were transported to the GSFP via forklift vehicles or carts.

Historic raw stock included sodium cyanide, alcohol, methanol, benzol, toluene, sulfuric & muriatic acids, metallic sodium, acetic acid, formic acid, sodium hydrosulfite, sulphur dioxide, soda ash, methyl ethyl ketone, ethylene diamine and mono methyl amine. Products historically manufactured included phenobarbital, barbital, cyclopal, pentobarbital, theophylline and aminophylline.

Manufacturing operations include chemical processes such as halogenation, reductive amination, diazotization, metallic sodium reactions, esterifications, alkylations, hydrogenations, condensation reactions, reductions, oxidations, etc. All chemical processing and operations mirrored that conducted at the GSFP, as discussed previously.

The following is a description of current and historic operations conducted within the property buildings/Rooms of the OSFP from 1946 to the present. Building construction dates were obtained from 1946 and 1949 Gane's Chemicals Works, Inc. Historical Site Maps.

ROOM ID	HISTORICAL ID	DESCRIPTION OF CURRENT AND HISTORICAL OPERATIONS
26	Z	1941 – Current Room 26(Z) (Office and Manufacturing Bldg.) constructed (size 52' x 34'). Pre-1941 to Recent History - Professional office, storage of office supplies & paints and manufacturing including the crystallization of phenobarbital in alcohol. Current – Offices and dedicated manufacturing of pseudoephedrin.
27	N/AP	Pre-1922 – Room 27 constructed as part of Franco-American Chemical Works. Pre-1946 to Pre-1949 – Room 27 utilized as packing building. Pre-1949 to Pre-1964 – Room 27 utilized for storage of used machinery. Pre-1964 to Pre-1981 – Room 27 utilized for crystallization. Pre-1981 to Recent History – Dedicated manufacturing of phenylephrine. Recent History – Storage of empty cardboard drums and machinery. Current – Idle.
28	N/AP	1940 – Room 28 constructed (size 47' x 40'). 1940 to Pre-1949 - Storage of soda ash in bags, sodium acetate in drums, sodium phosphate in bags, empty paper bags and cans, storage of oil in steel drums and empty paper cartons. Pre-1949 to Pre-1964 - Material storage of diethyl carbonate, ethyl bromide, oil, alcohol, salt, trisodium phosphate, calcium chloride, sodium nitrite, diethyl sulfate, sodium cyanide and empty containers. Current - Currently used to store safety supplies, empty drums and finished products.
29	N/AP	Post-1924 to Pre-1949 – Location of shed, auto house, 2,000-gallon water tank (AST), and former warehouse. 1949 – Current Room 29 constructed (size 47' x 33'). 1949 to Pre-1977 - Room 29 utilized for packing and mixing and location of locker rooms. Pre-1977 to Recent History – Room 29 utilized for blending and milling. Current – Multi use manufacturing, packing, and milling and blending.
30	N/AP	Post-1924 to Pre-1949 – Former location of coal pile and former warehouse. 1949 – Current Room 30 constructed (size 47' x 40'). 1949 to Current - Storage of empty containers and finished DEA controlled drug products, labeling and packing.
31	N/AP	Post-1924 to Pre-1949 – Partial location of former warehouse. 1949 – Current Room 31 constructed (size 58' x 33'). 1949 to Recent History – Crystallization of products. Recent History to Current – Dedicated manufacturing of pseudoephedrin.
32	N/AP	Post-1924 to Pre-1949 – Partial location of former warehouse. 1949 – Current Room 32 constructed (size 58' x 40'). 1949 to Recent History – Storage of caustic soda, chloroacetic acid, urea in bags, iron powder and ammonia. Current - Storage of finished product.

GARDEN STREET WAREHOUSE PROPERTY (GSWP) (BLOCK 2, LOT 8)

Block 2 was generally vacant until 1947, with the exception of some bleachers for a ball field located on the most easterly portion of the lot. Ganes Chemicals purchased Block 2 in 1947, installed a production well and constructed the present day material storage warehouse, sodium storage building, drum storage pad, and empty drum storage area.

Operations conducted on the GSWP consisted of the storage of raw materials within the Garden Street Warehouse (GSW) and outside in the drum storage pad. Raw materials are in both powder and liquid forms and are stored in compatible containers ranging in size from 1 to 55-gallons.

Also located northwest of the drum storage pad is a sodium storage building used to store water-reactive materials including sodium lithium diisopropyl amide (dissolved in tetrahydrofuran). Raw materials historically were delivered to the GSFP and OSFP via forklift vehicles.

A fenced and partially concreted area located on the most easterly portion of the GSWP is currently and historically used to store empty drums. The drums are pressure washed and wiped clean at the GSFP, prior to storage in this location.

SCHARG WAREHOUSE PROPERTY (SWP) (BLOCK 23, LOTS 1, 2, 1A, AND 1B)

Block 23 is currently occupied by Ganes Chemicals corporate office building, the former Scharg Warehouse (current Ganes storage) and an emergency equipment storage shed. Historically, Block 23 was also occupied by four residential dwellings. Due to the lack of quality tax assessor maps and title deed documents, the boundaries were not determined between lots 1, 1A, and 1B and therefore they are all described as Lot 1.

The following is a summary by parcel block and lot of current and historical operations conducted at the SWP.

Block 23, Lot 1
The Scharg Bros. Silk Factory located on the western portion of Lot 1 was constructed prior to 1902 and three residential dwellings (one along Broad Street and two along Garden Street) were constructed prior to 1917. In 1978, Ganes Chemicals purchased Lot 1 and the Scharg Warehouse was used by Ganes as a storage area for used equipment, office furniture, facility records and empty carboy drums until the present time. Ganes Chemicals also used the exterior area just southeast of the warehouse for storage of large equipment. In 1987, Ganes Chemicals constructed their corporate office building on the northwestern corner of Lot 1 and in 1998, removed/demolished the three residential dwellings.

Historical information dating back to the early 1900's regarding the operations conducted at the Scharg Bros. Silk Factory were unavailable. However, according to more recent information obtained from site representatives, the Scharg Bros. Silk Factory operated as a silk manufacturer utilizing the building for sewing purposes. Site representatives described the building as being occupied by numerous sewing machines. There was no indication of chemical storage historically or currently on Lot 1. However, according to available information, the Sharg Bros. Silk Factory utilized two underground storage tanks for the storage of heating oil for use in on-site boilers.

Block 23, Lot 2
Lot 2 has historically been occupied by a residential dwelling from 1902 until 1998 at which time Ganes Chemicals purchased the lot and removed/demolished the residential dwelling.

APPENDIX C

HAZARDOUS SUBSTANCES/WASTE INVENTORY
(Questions 3 and 4B)

APPENDIX C-1

FINISHED AND INTERMEDIATE PRODUCTS MANUFACTURED

APPENDIX C-1
FINISHED AND INTERMEDIATE PRODUCTS MANUFACTURED

Current Products up to December 1999

Bethanechol Chloride
Bretylium Tosylate
Butalbital
Carbachol
Dibenzosuberone
Dichloralphenazone
Dimenhydrinate
Isomethaptene Mucate
Isoxuprine HCl
Nifedipine
Oxymetazoline HCl
Pentobarbital
Pentobarbital Sodium
Phenazopyridine HCl
Phentermine HCl
Phenylepherine HCl
Primidone
Procainamide HCl
Proparacaine HCl
Propiophenone
Propoxyphene HCl
Propoxyphene Napsylate
Pseudoephedrine HCl
Pseudoephedrine Sulfate
Secobarbital Sodium
Trimethobenzamide HCl
Valproate Sodium
Valproic Acid
Venlasaxine HCL
AZC-10

Historical Products

Acetylcholine Bromide
Acetylcholine Chloride
Allopurinol
Allylcyclopentenylbarbituric Acid
Allylisobutylbarbituric Acid
Allylisobutylbarbiturate Sodium
Alphenal
Aminophylline, Hydrous USP-XVII
Aminopyrine
Ammonium Tartrate, Technical
Amobarbital USP-XVII
Amobarbital Sodium USP-XVII
Amylocaine HCl
Aprobarbital Barbital
Barbital Calcium
Barbital Sodium
Benzocine NF-XII
Butabarbital
Butabarbial Sodium NF-XII
Butethal NF-X
Caffeine Sodium Benzoate
Carbachol USP-XVII
Cyclopentenylallylbarbituric Acid
Dehydroacetic Acid
Dehydroacetate, Sodium
d,l-Desoxyephedrine Hydrochloride
Diallylbarbituric Acid
Diethylcarbamazine Citrate
Diethyl Diethyl Malonate
Dimethyl Diethyl Malonate
Dihydroxypropyl Theophylline
Dimenhydrinate
Dimercaprol USP-XVII
Diphenhydramine Hydrochloride
Dipyrone
Glutethimide NF-XII
Glyceryl Guaicolate
Hexobarbital
Hydroxyethyl Theophylline
Indicators, Metals
Isoproterenal Hydrochloride USP-XVII
Isoproterenol Sulfate USP-XVII
Meclizine Dihydrochloride USP-XVII
Mephobarbital NF-XIII
Mephobarbital USP-XVII
Mephobarbital Sodium
Mersalyl Acid
Mersalyl Sodium NF-XI
Methacholine Chloride NF-XIII
Methamphetamine Hydrochloride
Methaqualone
Methoxyphenamine HCl
Pamabrom
Para-Aminobenzoic Acid
Para-Aminobenzoate, Calcium
Para-Aminobenzoate, Potassium
Para-Aminobenzoate, Sodium
Pentobarbital Acid
Pentobarbital Calcium
Pentobarbital Sodium USP-XVII
Phenacaine Hydrochloride NF-XII
Phendimetrazine Bitartrate
Phenindione NND
Phenobarbital USP-XVII
Phenobarbital Calcium
Phenobarbital Sodium USP-XVII
Phenylazopyridine HCl, NF-XIII
Phenylephrine Base
Phenylephrine Bitartrate
Phenylephrine Tartrate
Phenylephrine HCl USP-XVII
Phenylpropanolamine Hydrochloride
Potassium Para-Aminobenzoate
Primidone USP-XVIII
Probenecid USP-XVIII
Procaineamide HCl USP-XVIII
Propantheline Bromide USP-XVIII
Propoxyphene HCl USP-XVIII
Pseudoephedrine Base
Pseudoephedrine Hydrochloride
Secobarbital USP-XVII
Secobarbital Sodium USP-XVII
Sodium Para-Aminobenzoate
Sodium n-Amylethylbarbiturate
Sodium Thiaylal
Sodium Thiopental
Tetracaine Base
Tetracaine HCl USP-XVIII
Theophylline, Anhydrous NF-XII
Theophylline Hydrate
Theophylline and Sodium Acetate
Theophylline Sodium Glycinate
Vinbarbital NF-XIII

APPENDIX C-2

HAZARDOUS MATERIALS USAGE

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Acetaldehyde	75-07-0	UK	30-491	UK	Purchase Records
Acetanilide	103-84-4	UK	0-51,750	UK	Purchase Records
Acetic Acid	64-19-7	AST, DP	50,001-100,000	Tank Farm, Garden St. Storage Courtyard, Ubiquitous	Tier II Reporting Purchase Records
Acetic Anhydride	108-24-7	UST	10,001-100,000	Outside Room 9, Rooms 7 & 9, Courtyard, Ubiquitous	Tier II Reporting Purchase Records
Acetone	67-64-1	DS	10,001-50,000	Ubiquitous	Tier II Reporting Purchase Records
Acetonitrile	75-05-8	UK	10,001-50,000	Ubiquitous	Tier II Reporting
Acetophenetidin (Phenacetin)	62-44-2	UK	50-500	UK	Purchase Records
Adipic acid	124-09-9	UK	0-50	UK	Purchase Records
Alcohol, anhydrous	N/AP	UK	17,550-55,890 gallons	UK	Purchase Records
Allyl bromide	106-95-6	UK	980-2,700	UK	Purchase Records
Allyl chloride	107-05-1	DS	420-8,300	Room 2	Tier II Reporting Purchase Records
Aluminum chloride	7446-70-0	UK	0-25	UK	Purchase Records
Aluminum isopropylate (Aluminum isopropoxide)	N/AP	UK	0-540	UK	Purchase Records
m-Aminoacetophenone	99-03-6	DF	10,001-50,000	Room 5	Tier II Reporting Purchase Records
p-Aminobenzoic acid	150-13-0	UK	197-63,604	UK	Purchase Records
Amino isobutanol	N/AP	UK	459-2,501	UK	Purchase Records
Aminoketone	N/AP	UK	0-721	UK	Purchase Records
1-2-Amino-1-4-methoxyphenyl ethyl cyclohexanol	N/AP	DF	10,001-50,000	Rooms 4 & 7 Garden St. Warehouse	Tier II Reporting
2-Amino-2-methyl-1-propanol	124-68-5	UK	0-840	UK	Purchase Records
Aminophylline	317-34-0	UK	0-10	UK	Purchase Records
Ammonia	7664-41-7	UK	0-82,675	UK	Purchase Records
Ammonia, anhydrous	N/AP	UK	105-12,300	UK	Purchase Records
Ammonia, aqueous 25%	1336-21-6	DP	375-45,221	Rooms 7 & 27	Tier II Reporting Purchase Records
Ammonium acetate	631-61-8	UK	450-2,975	UK	Purchase Records
Ammonium Bicarbonate	1066-33-7	UK	<1	Room 14	Tier II Reporting
Ammonium carbonate	10361-29-2	UK	250-375	Room 14	Purchase Records/Tier II
Ammonium chloride	12125-02-9	UK	1-10	QC Laboratory, Rm 14	Tier II Reporting
Ammonium chromate	7788-98-9	UK	<1	Room 14	Tier II Reporting

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Ammonium dichromate	7789-09-5	UK	<1	Room 14	Tier II Reporting
Ammonium hydroxide	1336-21-6	DP	1,001-10,000	Garden St. Warehouse Ubiquitous	Tier II Reporting Purchase Records
Ammonium sulfide	12135-76-1	UK	2,250-11,577	UK	Purchase Records
Ammonium tartrate	3164-29-2	DF	10,001-50,000	Garden St. Warehouse	Tier II Reporting
Ammonium thiocyanante	1762-95-4	UK	<1	QC Laboratory	Tier II Reporting
Amobarbital	57-43-2	UK	0-100	UK	Purchase Records
Amobarbital sodium	64-43-7	UK	0-2	UK	Purchase Records
Antipryrine	60-80-0	DF	1,001-10,000	Room 5	Tier II Reporting
Aprobarbital	77-02-1	UK	100-125	UK	Purchase Records
Arsenious acid	N/AP	UK	0-437	UK	Purchase Records
Barium oxide	1304-28-5	UK	0-100	UK	Purchase Records
Benzaldehyde	100-52-7	UK	350-1,775	UK	Purchase Records
Benzene (Benzol)	71-43-2	UK	300-14,089 gals	UK	Purchase Records
Benzocaine (Ethyl aminobenzoate)	94-09-7	UK	1,000-7,000	UK	Purchase Records
Benzoyl chloride	98-88-4	DS	10,001-50,000	Room 5 Garden St. Storage	Tier II Reporting Purchase Records
m-Benzoyloxy-acetophenone	N/AP	DP	10,001-50,000	Rooms 5 & 8	Tier II Reporting
Benzyl chloride	100-44-7	UK	0-32,925	UK	Purchase Records
Benzyl cyanide	140-29-4	UK	14,400-43,445	UK	Purchase Records
Benzylidene acetone	122-57-6	UK	0-140	UK	Purchase Records
Benzylideneacetone	122-57-6	UK	0-150	UK	Purchase Records
Bromine	7726-95-6	DS	1,001-10,000	Rooms 8 & 25	Purchase Records
a-Bromo-m-benzoyloxyacetonphenone	N/AP	DP	1,001-10,000	Rooms 1 & 8	Tier II Reporting
Butabarbital acid	N/AP	UK	5-44	UK	Purchase Records
Butabarbital sodium	143-81-7	UK	25-445	UK	Purchase Records
Butadiene	106-99-0	UK	0-220	UK	Purchase Records
Butyl aminobenzoate	N/AP	UK	0-11	UK	Purchase Records
Butyl ether	142-96-1	UK	680-5,100	UK	Purchase Records
Butyraldehyde	123-72-8	UK	<1	QC Laboratory	Tier II Reporting
CAE distillation by Newark	N/AP	UK	1,977-4,271	UK	Purchase Records
Caffeine, anhydrous	58-08-2	UK	100-2,000	UK	Purchase Records
Calcium acetate	62-54-4	UK	125-625	UK	Purchase Records
Calcium chloride	10043-52-4	UK	3,000-188,900	UK	Purchase Records
Calcium salicylate	N/AP	UK	0-2	UK	Purchase Records
Calcium succinate	140-99-8	UK	200-1,000	UK	Purchase Records
Carbachol chloride (Carbachol)	51-83-2	UK	11-100	Warehouse	Tier II Reporting
Carbon tetrachloride	56-23-5	UK	66-1,388	UK	Purchase Records
Catechol CP	154-23-4	UK	0-330	UK	Purchase Records
Cetyl chloride	N/AP	UK	0-2,000	UK	Purchase Records

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Chloral hydrate	302-17-0	DP, DF	1,001-10,000	Garden St. Warehouse Ubiquitous	Tier II Reporting
Chlorine	7782-50-5	UK	0-80	UK	Purchase Records
p-Chloroaniline	106-47-8	UK	526-1,015	UK	Purchase Records
Chlorobenzene	108-90-7	DS	101-1,000	Ubiquitous	Tier II Reporting
Chlorobutanol, anhydrous	57-15-8	UK	5-50	UK	Purchase Records
Chloroform	67-66-3	UK	50-3,910	UK	Purchase Records
Chlorosulfonic acid	7790-94-5	UK	0-112,700	UK	Purchase Records
8-Chlorotheophylline	85-18-7	DF	1,001-10,000	Ubiquitous	Tier II Reporting
Chromic acid	7738-94-5	UK	10-500	Room 14	Tier II Reporting Purchase Records
Chromium potassium sulfate	N/AP	UK	<1	Room 14	Tier II Reporting
Cinchophen	132-60-5	UK	0-459	UK	Purchase Records
Citric acid, anhydrous	77-92-9	UK	100-1,000	UK	Purchase Records
Copper	7740-50-8	UK	1-10	Room 14	Tier II Reporting
Copper chloride	1344-67-8	UK	1-10	Room 14	Tier II Reporting
Creosote carbonate NF	N/AP	UK	0-48	UK	Purchase Records
Cupric sulfate	7758-98-7	UK	100-6,750	UK	Purchase Records
Cyanoacetic acid	372-09-8	UK	24-30,000	UK	Purchase Records
Cyclohexane	110-82-7	DS	101-1,000	Room 8 Ubiquitous	Tier II Reporting
Cyclohexanone	108-94-1	DS	1,001-10,000	Garden St. Warehouse Ubiquitous	Tier II Reporting Purchase Records
Cyclohexylamine	108-91-8	UK	1-10	Room 14	Tier II Reporting
Cyclopentadiene	542-92-7	UK	0-220	UK	Purchase Records
Darco	N/AP	UK	500-5,450	UK	Purchase Records
Decalin	91-17-8	UK	0-2,697	UK	Purchase Records
Dehydroacetic acid	520-45-6	UK	70-1,500	UK	Purchase Records
Desoxyephedrine hydrochloride	N/AP	UK	150-465	UK	Purchase Records
Dextroamphetamine sulfate	51-63-8	UK	13-35	UK	Purchase Records
Dicalite	N/AP	UK	0-1,000	UK	Purchase Records
Dichloralphenazone Usp	480-30-8	DF	10,001-50,000	Room 26 Garden St. & Orchard Warehouses	Tier II Reporting
Dicyanodiamide	461-58-5	UK	0-6,000	UK	Purchase Records
Dicyclopentadiene (Cyclopentadiene)	542-92-7	UK	900-10,380	UK	Purchase Records
Diethyl malonate (Ethyl malonate)	105-53-3	UK	450-49,145	UK	Purchase Records
Diethyl oxalate	95-92-1	UK	9,800-126,025	UK	Purchase Records
Diethyl sulfate	64-67-5	UK	6,360-103,880	UK	Purchase Records
Diethylamine	109-89-7	UK	600-3,000	UK	Purchase Records
Diethylaminoethanol	100-37-8	UK	0-6,210	UK	Purchase Records
Diethylethanolamine	N/AP	UK	23-7,700	UK	Purchase Records

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
1,8-Dihydroxy-anthraquinone (Danthron)	117-10-2	UK	0-23	UK	Purchase Records
Dimenhydrinate	523-87-5	DF	1,001-10,000	Orchard St. Warehouse	Tier II Reporting
4-Dimethylaminoazo-benzene	60-11-7	UK	<1	Room 14	Tier II Reporting
3-3-Dimethylbenzidine	119-93-7	UK	<1	Room 14	Tier II Reporting
N,N -Dimethylformamide	68-12-2	DS	1,001-10,000	Ubiquitous	Tier II Reporting Purchase Records
Dimethyl sulfate	77-78-1	UK	0-50	UK	Purchase Records
Dimethyl urea	N/AP	UK	118-54,050	UK	Purchase Records
Dimethylamine, 40% in water	124-40-3	DS	1,001-10,000	Room 8	Tier II Reporting Purchase Records
Dimethylaniline	121-69-7	UK	0-37	UK	Purchase Records
1-4 Dioxane	123-91-1	UK	1-10	Room 14	Tier II Reporting
Diphenhydramine base	58-73-1	DS	1,001-10,000	Garden St. Warehouse	Tier II Reporting
Diphenylacetonitrile	N/AP	UK	0-441	UK	Purchase Records
Dipropyl Ketone	123-91-3	UK	1-10	Room 14	Tier II Reporting
E-distillation by Newark	N/AP	UK	297-1,512	UK	Purchase Records
Ephedra	N/AP	UK	0-424,386	UK	Purchase Records
Ephedrine alkaloid	N/AP	UK	100-250 oz	UK	Purchase Records
l- Ephedrine base	299-42-3	DF	1,001-10,000	Room 33 Garden St. Warehouse	Tier II Reporting
Ephedrine hydrochloride	50-98-6	DF	10,001-50,000	Room 33 Garden St. Warehouse	Tier II Reporting Purchase Records
Ephedrine sulfate	134-72-5	UK	1,200-2,600 oz	UK	Purchase Records
Epichlorohydrin	106-89-8	UK	530-2,650	UK	Purchase Records
Epinephrine bitartrate	51-42-3	UK	908-1,362 grams	UK	Purchase Records
Ethanol, SDA 2B, anhydrous	64-17-5	UST	10,001-50,000	Room 4, Tank farm, Ubiquitous	Tier II Reporting
2-Ethoxyethanol	110-80-5	UK	1-10	Room 14	Tier II Reporting
Ethoxyethyl acetate (Cellosolve)	111-15-9	UK	0-5,775	UK	Purchase Records
Ethyl acetate	141-78-6	DS	1,001-10,000	Ubiquitous	Tier II Reporting Purchase Records
Ethyl acetoacetate	141-97-9	UK	0-200	UK	Purchase Records
Ethyl alcohol	64-17-5	UK	65,016 gals	Room 14	Purchase Records
Ethyl bromide	74-96-4	UK	5,000-100,955	UK	Purchase Records
Ethyl carbonate (Diethyl carbonate)	105-58-8	UK	2,347-81,839	UK	Purchase Records
Ethyl chloroformate	541-41-3	UK	<1	QC Laboratory	Tier II Reporting
Ethyl cyanoacetate	105-56-6	DS	1,001-10,000	Room 2, Boiler Room, Ubiquitous	Tier II Reporting
Ethyl diethylmalonate (DEM)	77-25-8	UK	1,400-1,528	UK	Purchase Records

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Ethyl ether (Ether)	60-27-7	UK	27-499	UK	Purchase Records
Ethylmercuric chloride	107-27-7	UK	<1	Room 14	Tier II Reporting
Ethyl phenyl acetate	101-97-3	UK	4,560-101,589	UK	Purchase Records
Ethyl a-phenylbutyrate	N/AP	UK	0-449	UK	Purchase Records
Ethyl phenylcyanacetate	N/AP	UK	0-5	UK	Purchase Records
Ethylene carbonate	N/AP	UK	260-1,180	UK	Purchase Records
Ethylene diamine	107-15-3	UK	885-6,886	UK	Purchase Records
Ethylene dichloride	107-06-2	UK	560-3,920	UK	Purchase Records
Ethylene glycol	107-21-1	UK	0-180	UK	Purchase Records
Ferric chloride	7705-08-0	UK	<1	QC Laboratory	Tier II Reporting
Ferrous sulfate	7720-78-7	UK	1-10	Room 14	Tier II Reporting
Formaldehyde	50-00-0	DP, DS	10,001-50,000	Room 4,14 Garden St. Storage	Tier II Reporting
Fumeric Acid	118-17-8	UK	<1	Room 14	Tier II Reporting
Furfural	98-01-1	UK	<1	Room 14	Tier II Reporting
Paraformaldehyde	30525-89-4	UK	<1	QC Laboratory	Tier II Reporting
Formic acid	64-18-6	DP, DS	6,250-173,925	Ubiquitous	Tier II Reporting Purchase Records
Fuel oil # 6	68556-00-4	UST	10,001-50,000	Courtyard	Tier II Reporting
Guaiacol	90-05-1	UK	5-2,470	UK	Purchase Records
Guanidine carbonate	N/AP	UK	0-600	UK	Purchase Records
Guanidine nitrate	506-93-4	UK	1,110-72,468	Rm 14	Purchase Records/ Tier II
Hazardous Waste, N.O.S.	N/AP	DF, DS	10,001-50,000	Courtyard	Tier II Reporting Purchase Records
Heptane	142-82-5	DS	1,001-10,000	Ubiquitous	Tier II Reporting Purchase Records
Homatropine methylbromide	80-49-9	UK	35-200 oz	UK	Purchase Records
Hydrazine hydrate	7803-57-8	UK	25-50	UK	Purchase Records
Hydriodic Acid	10034-85-2	UK	<1	Room 14	Tier II Reporting
Hydrochloric acid	7647-01-0	DP	10,001-50,000	Ubiquitous	Tier II Reporting Purchase Records
Hydrogen	1333-74-0	CY	1,001-10,000 lbs 4,620-259,582 ft^3	Room 9 & next to Room 25 Garden St. Storage	Tier II Reporting Purchase Records
Hydrogen chloride	7647-01-0	UK	60-1,100	Rm 14	Purchase Records/ Tier II
Hydrogen peroxide	7722-84-1	UK	120-1,200	Room 14	Purchase Records
Hydrogen Sulfide	7783-36-4	UK	11-100	Room 14	Tier II Reporting
Hydroxyacetic acid (Glycolic acid)	79-14-1	UK	0-495	UK	Purchase Records
(Hydroxycyclohexyl)-4-methoxybenzene-acetonitrile	131-80-6	DF	10,001-50,000	Rooms 4, 6 & 9 Garden St. Warehouse Ubiquitous	Tier II Reporting

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Hypophosphorus acid	6303-21-5	UK	300-540	UK	Purchase Records
Iodine	7553-56-2	UK	0-5	UK	Purchase Records
Iron	7439-89-6	UK	0-23,500	UK	Purchase Records
Isoamyl alcohol (Isopentyl alcohol)	123-51-3	UK	2,220-3,435	UK	Purchase Records
Isobutyl alcohol	78-83-1	UK	101-1,000	Ubiquitous	Tier II Reporting
Isobutyraldehyde	78-84-2	UK	1,050-5,950	UK	Purchase Records
Isonitroso	N/AP	UK	0-1,813	UK	Purchase Records
Isopropyl alcohol	67-63-0	DS	101-1,000	Tank farm, Ubiquitous	Tier II Reporting Purchase Records
Isopropylamine	75-31-0	UK	0-600	UK	Purchase Records
Kemsolene	N/AP	UK	104-1,040 gals	UK	Purchase Records
Lead Nitrate	10099-74-8	UK	<1	Room 14	Tier II Reporting
Lithium	7439-93-2	UK	<1	Room 14	Tier II Reporting
Lithium diisopropylamide	4111-54-0	CY	1,001-10,000	Room 4 Sodium Building	Tier II Reporting
Magnesium	7439-95-4	UK	1-10	Room 14	Tier II Reporting
Magnesium Nitrate	10377-60-3	UK	<1	Room 14	Tier II Reporting
Maleic acid	110-16-7	UK	101-1,000	Room 14	Tier II Reporting
Manganese Dioxide	1313-13-9	UK	1-10	Room 14	Tier II Reporting
Mephobarbital	115-38-8	UK	10-80	UK	Purchase Records
Mercuric Acetate	1600-27-7	UK	1-10	Room 14	Tier II Reporting
Mercuric chloride	7487-94-7	UK	0-5	UK	Tier II Reporting Purchase Records
Mercuric oxide	21908-53-2	UK	0-35	UK	Purchase Records
Methanol	67-56-1	DS	28,640-133,892	Ubiquitous	Tier II Reporting Purchase Records
(p-Methoxyphenyl) acetonitrile	51927-56-1	DS	1,001-10,000	Room 4	Tier II Reporting
Methylamine	74-89-5	DS	1,001-10,000	Room 1 Garden St. Storage	Tier II Reporting
a-Methylamino-m-hydroxyacetophenone sulfate	N/AP	DF	1,001-10,000	Room 1	Tier II Reporting
Methyl amyl ketone (2-Heptanone)	110-43-0	UK	0-60	UK	Purchase Records
Methyl butyl diethyl malonate	N/AP	UK	0-5	UK	Purchase Records
Methyl t-butyl ether	1634-04-4	DS	101-1,000	Room 17, Ubiquitous	Tier II Reporting
Methyl chloride	74-87-3	UK	0-4,200	UK	Purchase Records
Methyl ethyl ketone	78-93-3	DS	720-30,020	Room 14	Tier II Reporting Purchase Records
Methyl isobutyl ketone	108-10-1	DS	1,001-10,000	Ubiquitous	Tier II Reporting
Methyl isobutyl ketone	108-10-1	DS	1,001-10,000	Ubiquitous	Tier II Reporting
Methyl propyl ketone	107-87-9	UK	10,080-33,580	UK	Purchase Records

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Methyl propyl ketone	107-87-9	UK	1,005-40,361	UK	Purchase Records
6-Methyluracil	626-48-2	UK	0-100	UK	Purchase Records
Methylene chloride	75-09-2	UK	0-190	UK	Purchase Records
Methylpropyl carbinol (2-Pentanol)	6032-29-7	UK	360-10,470	UK	Purchase Records
Mono methyl urea	598-50-5	DP	1,001-10,000	Garden St. Warehouse	Tier II Reporting
Monochloracetic acid (Chloroacetic acid)	79-11-8	UK	6,000-200,100	UK	Purchase Records
Monomethylamine (Methylamine)	74-89-5	DS	600-69,079	Outside Room 1	Tier II Reporting Purchase Records
Muriatic acid	7647-01-0	DP	1,180-192,970	Ubiquitous	Tier II Reporting Purchase Records
Nicotinic acid	59-67-6	UK	441-15,682	UK	Purchase Records
Nicotinic ester distillation	N/AP	UK	2,221-13,589	UK	Purchase Records
Nikethamide distillation	N/AP	UK	321-2,305	UK	Purchase Records
Nitric acid	7697-37-2	DS	551-10,800	Ubiquitous	Tier II Reporting Purchase Records
p-Nitrobenzoic acid	UK	UK	4,185-26,800	UK	Purchase Records
p-Nitrobenzoyl Chloride	122-04-3	UK	8,953-10,989	UK	Purchase Records
Nitrobenzol (Nitrobenzene)	98-95-3	UK	0-50	UK	Purchase Records
Nitrogen Cryogenic Liquid	N/AP	AST	10,001-50,000	Courtyard	Tier II Reporting
O-distillation by Newark	N/AP	UK	469-2,486	UK	Purchase Records
Palladium	7440-05-3	UK	933-3,443 grams	UK	Purchase Records
Palladium chloride	7647-10-1	UK	1,000-15,000 grams	UK	Purchase Records
Pent-0 distillation	N/AP	UK	782-12,417	UK	Purchase Records
Pent-1 distillation	N/AP	UK	0-11,138	UK	Purchase Records
Pentane	109-66-0	UK	50-300 gals	UK	Purchase Records
Pentobarbital	76-74-4	UK	0-298	UK	Purchase Records
Pentobarbital acid	N/AP	UK	0-1,000	UK	Purchase Records
Pentobarbital sodium	57-33-0	UK	0-110	UK	Purchase Records
Perchloroethylene (Tetrachloroethylene)	127-18-4	UK	0-1400	UK	Purchase Records
Phenacaine hydrochloride	620-99-5	UK	0-2	UK	Purchase Records
p-Phenetidine	156-43-4	UK	160-450	UK	Purchase Records
Phenobarbital	50-06-6	UK	0-3,000	UK	Purchase Records
Phenol	108-95-2	UK	0-3,071	UK	Purchase Records
Phenyl acetone	103-79-7	UK	0-750	UK	Purchase Records
l- Phenylephrine base	59-42-7	DF	1,001-10,000	Orchard St. Warehouse	Tier II Reporting Purchase Records
Phenylephrine hydrochloride	61-76-7	UK	0-2,000 grams	UK	Purchase Records
Phenyltoloxamine	92-12-6	DS	1,001-10,000	Garden St. Storage	Tier II Reporting
Phosgene	75-44-5	UK	40-75,101	UK	Purchase Records

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Phosphorus oxychloride	10025-87-3	DP	10,001-50,000	Room 17	Tier II Reporting Purchase Records
Phosphorus trichloride	7719-12-2	DS	1,001-10,000	Room 8 Garden St. Warehouse	Tier II Reporting
Phthalide	N/AP	UK	1,544-2,000	UK	Purchase Records
Piperazine	110-85-0	UK	1,176-1,963	UK	Purchase Records
Piperazine hexahydrate	N/AP	UK	0-50	UK	Purchase Records
Piperidine	110-89-4	UK	70-210	UK	Purchase Records
Potassium carbonate, anhydrous	584-08-7	UK	0-50	UK	Purchase Records
Potassium hydroxide (Caustic potash)	1310-58-3	UK	101-1,000	Ubiquitous	Purchase Records
Potassium iodide	7681-11-0	UK	20-65	UK	Purchase Records
Potassium p-aminobenzoate	138-84-1	UK	3-200	UK	Purchase Records
Potassium permanganate	7722-64-7	UK	10-77,561	UK	Purchase Records
Procainamide hydrochloride	614-39-1	UK	1,500	UK	Purchase Records
Propionyl chloride	79-03-8	UK	0-20	UK	Purchase Records
Propiophenone	95-55-0	DS	10,001-50,000	Garden St. Warehouse	Tier II Reporting Purchase Records
Propylene gylcol	57-55-6	UK	0-1,880	UK	Purchase Records
d-Pseudoephedrine base	90-82-4	DF	50,001-100,000	Rooms 9, 2, 26, 31 Orchard St. Warehouse	Tier II Reporting
d-Pseudoephepdrine Bisulfate	N/AP	DF	1,001-10,000	Room 9 & 31 Orchard St. Warehouse	Tier II Reporting
Pseudoephedrine hydrochloride	345-78-8	DF	10,001-50,000	Rooms 26 & 2 Garden St. & Orchard St. Warehouses	Tier II Reporting
Pseudoephedrine sulfate USP	7460-12-0	DF	10,001-50,000	Room 31 Garden St. & Orchard St. Warehouses	Tier II Reporting
Pyridine	110-86-1	DS	1,001-10,000	Room 8, Ubiquitous	Tier II Reporting Purchase Records
Quinine sulfate	804-63-7	UK	2,000 oz	UK	Purchase Records
Quinoline	91-22-5	DS	1,001-10,000	Boiler Room	Tier II Reporting Purchase Records
Raney #28 Active Nickel Catalyst	7440-02-0	DS	101-1,000	Room 9	Tier II Reporting Purchase Records
Sodium	7440-23-5	UK	29,400-102,072	UK	Purchase Records
Sodium acetate	127-09-3	UK	25-1,385	UK	Purchase Records
Sodium aprobarbital	N/AP	UK	10-100	UK	Purchase Records
Sodium barbital	144-02-5	DF	1,001-10,000	Orchard St. Warehouse	Tier II Reporting
Sodium benzoate	532-32-1	UK	100-3,000	UK	Purchase Records
Sodium bisulfite	7631-90-5	UK	400-40,000	UK	Purchase Records

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
Hazardous Material Usage

Material Name	CAS#	Storage Container	Typical Annual Usage (in lbs, unless otherwise noted)	Location	Information Source
Sodium bromide	7647-15-6	UK	0-5,112	UK	Purchase Records
Sodium carbonate (Soda ash)	497-19-8	UK	300-70,000	UK	Purchase Records
Sodium chloride	7647-14-5	BA, DF	280-20,160	Garden St. Warehouse Ubiquitous	Tier II Reporting Purchase Records
Sodium cyanide	143-33-9	UK	1,500-80,000	UK	Purchase Records
Sodium dehydroacetate	N/AP	UK	3,000-4,582	UK	Purchase Records
Sodium formate	141-53-7	UK	100-1,000	UK	Purchase Records
Sodium hydrosulfite	7775-14-6	UK	79,410-260,320	UK	Purchase Records
Sodium hydroxide	1310-73-2	DP, UST	40,503-487,479	Courtyard, Ubiquitous	Tier II Reporting
Sodium methylate (Sodium methoxide)	124-41-4	UK	0-1,118	UK	Purchase Records
Sodium nitrite	7632-00-0	BA, DF	1,200-53,606	Room 5, Garden St. Warehouse, Ubiquitous	Tier II Reporting Purchase Records
Sodium phosphate, tribasic	7601-54-9	UK	500-11,400	UK	Purchase Records
Sodium salicylate	54-21-7	UK	400 lbs	UK	Purchase Records
Sodium sulfacetamide	N/AP	UK	25-100	UK	Purchase Records
Sodium sulfathiazole	N/AP	UK	0-50	UK	Purchase Records
Sodium sulfide	1313-82-2	UK	1,340-3,000	UK	Purchase Records
Succinic acid	110-15-6	UK	0-850	UK	Purchase Records
Sulfanilamide	63-74-1	UK	0-25	UK	Purchase Records
Sulfathiazole	72-14-0	UK	25-1,000	UK	Purchase Records
Sulfur dioxide	7446-09-5	UK	4,350-23,250	UK	Purchase Records
Sulfuric acid	7664-93-9	AST	165,540-557,713	Courtyard, Tank Farm, Ubiquitous	Tier II Reporting Purchase Records
Tannic acid	N/AP	UK	0-825	UK	Purchase Records
Tartaric acid	87-69-4	DF	1,001-10,000	Garden St. Warehouse	Tier II Reporting Purchase Records
Tergital P-28	N/AP	UK	0-1,840	UK	Purchase Records
Terpin hydrate	2541-01-6	UK	600-1,500	UK	Purchase Records
Tetrahydrofuran	109-99-9	DS	10,001-50,000	Room 4, Ubiquitous	Tier II Reporting
Tetralin	119-64-2	UK	8-50	UK	Purchase Records
Theobromine	83-67-0	UK	0-15	UK	Purchase Records
Theophylline	58-55-9	UK	3,012-9,563	UK	Purchase Records
Thionyl chloride	7719-09-7	UK	75-910	UK	Purchase Records
Thiourea	62-56-6	UK	0-160	UK	Purchase Records
Toluene (Toluol)	108-88-3	UST	1,001-10,000	Outside Room 25, Ubiquitous, Courtyard	Tier II Reporting Purchase Records
Trichloroethylene	79-01-6	UK	89-4,550	UK	Purchase Records
Triethylamine	121-44-8	UK	101-1,000	Ubiquitous	Tier II Reporting
Trimethylamine	75-50-3	DS	1,001-10,000	Room 17	Tier II Reporting
Urea	57-13-6	UK	15,100-100,000	UK	Purchase Records
Uric Acid	69-93-2	UK	0-22	UK	Purchase Records
Vanillin	121-33-5	UK	0-25	UK	Purchase Records

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-2
HAZARDOUS MATERIAL USAGE

MATERIAL NAME	CAS#	STORAGE CONTAINER	TYPICAL ANNUAL USAGE (in lbs, unless otherwise noted)	LOCATION	INFORMATION SOURCE
Vatrolite	UK	UK	1,000	UK	Purchase Records
Venlafaxine base	93413-69-5	DF	1,001-10,000	Room 24, Garden St. Warehouse	Tier II Reporting
Versene (Edetate sodium)	64-02-8	UK	50-650	UK	Purchase Records
Versenol	UK	UK	0-50	UK	Purchase Records
Xylene (mixed isomers)	1330-20-7	AST	1,001-10,000	Tank Farm, Ubiquitous	Tier II Reporting
Zinc chloride	7646-85-7	UK	101-1,000	Ubiquitous	Tier II Reporting
Zinc dust	7440-66-6	UK	150-800	UK	Purchase Records

Sources of Information:
Annual Purchase Records (1934-1959)
Tier II Reporting (1987-1997)

AST=Aboveground Storage Tank BA=Bag CY=Cylinder DF=Fiber Drum DP=Plastic Drum DS=Steel Drum N/AP=Not Applicable UK=Unknown UST=Underground Storage Tank

APPENDIX C-3

HAZARDOUS WASTE GENERATION

APPENDIX C-3
HAZARDOUS WASTE GENERATION

WASTE CODE	HAZARDOUS WASTE DESCRIPTION	QUANTITY GENERATED	UNITS	STORAGE CONTAINER	YEAR	INFORMATION SOURCE
D001	Hazardous waste solid N.O.S. Exhibits the characteristics of ignitability	424	lbs	D, LP	1997	HW Manifests
		343	lbs	D	1996	HW Manifests
		40	lbs	D	1995	HW Manifests
		9,500	lbs	UK	1988	Annual Report
		5,400	lbs	UK	1987	Annual Report
		12,600	lbs	UK	1986	Annual Report
		9,600	lbs	UK	1985	Annual Report
		20,500	lbs	UK	1981	Annual Report
	Waste Flammable Liquid, N.O.S., pharmaceutical by-products in solvents	57,653	gals	UK	1987	Annual Report
		35,074	gals	UK	1987	Annual Report
		10,750	gals	UK	1985	Annual Report
		4,500	gals	UK	1981	Annual Report
D001/ D002	HW Solid, N.O.S.	5,250	lbs	UK	1987	Annual Report
		4,550	lbs	UK	1986	Annual Report
D002	Waste Corrosive Liquids Generally laboratory wastes	1,643	lbs	D, LP	1997	HW Manifests
		1,048	lbs	D	1996	HW Manifests
	Waste acid from tank cleanout	220	gals	UK	1992	Annual Report
	HW Solid, N.O.S.	2,050	lbs	UK	1986	Annual Report
		3,000	lbs	UK	1985	Annual Report
		385	gals	UK	1985	Annual Report
		500	lbs	UK	1981	Annual Report
D003	Waste Sodium Methylate Exhibits the characteristics of reactivity	125	lbs	D	1997	HW Manifests
		72	lbs	D	1996	HW Manifests
D006	HW Liquid, N.O.S., contains Cadmium	3,800	lbs	D	1997	HW Manifests
D007	Waste Toxic Solids, Inorganic, contains Chromium	25	lbs	D	1996	HW Manifests
D009	Waste Mercury Compounds, Solid, contains Mercury	6	lbs	D	1996	HW Manifests
F002	HW Solid, N.O.S. Spent halogenated solids	500	lbs	D	1995	HW Manifests
F002 F005 D007 D008 D018	HW Solid -wastewater sludge, containing non-halogenated solvents, chromium, lead and benzene.	500	lbs	UK	1994	Annual Report
		1,000	lbs	UK	1992	Annual Report
		1,000	lbs	UK	1991	Annual Report
		3,200	lbs	UK	1990	Annual Report
F003	Waste Flammable Liquid, N.O.S. Spent non-halogenated solvents	442,657	gals	D	1997	HW Manifests
		269,563	gals	TT, D	1996	HW Manifests
		260,457	gals	TT	1995	HW Manifests
F003 F005 D001 D035	Waste Flammable Liquid, N.O.S. Spent non-halogenated solvents (Some wastes may contain MEK)	220,001	gals	UK	1994	Annual Report
		144,323	gals	UK	1993	Annual Report
		69,287	gals	UK	1992	Annual Report
		59,893	gals	UK	1991	Annual Report
		46,098	gals	UK	1990	Annual Report
F003/ F005	Waste Flammable Liquid, N.O.S.	69,722	gals	UK	1989	Annual Report
		59,650	gals	UK	1988	Annual Report
		4,800	gals	UK	1987	Annual Report

D=Drum HW=Hazardous Waste LP=Labpack ND=Not Designated N.O.S.=Not Otherwise Specified TT=Tank UK=Unknown

APPENDIX C-3
HAZARDOUS WASTE GENERATION

WASTE CODE	HAZARDOUS WASTE DESCRIPTION	QUANTITY GENERATED	UNITS	STORAGE CONTAINER	YEAR	INFORMATION SOURCE
F005	Spent non-halogenated solvents with Pharmaceutical Impurities	500	lbs	UK	1994	Annual Report
	Waste Flammable Liquid, N.O.S.	5177	gals	UK	1988	Annual Report
		9,420	gals	UK	1986	Annual Report
		40,492	gals	UK	1985	Annual Report
		24,700	gals	UK	1981	Annual
P029	Waste Cyanide, Inorganic, Solid Contains copper cyanide	5	lbs	D, LP	1997	HW Manifests
P098	Waste Potassium Cyanide	11	lbs	D, LP	1997	HW Manifests
P105	Waste contains Sodium Azide	40	lbs	D, LP	1997	HW Manifests
P106	Waste Sodium Cyanide	2	lbs	D, LP	1997	HW Manifests
U068	Waste Toxic Liquid, Organic, N.O.S., contains Methane, dibromo-	15	lbs	D	1996	HW Manifests
U103	Waste Dimethyl Sulfate	1	lbs	D, LP	1997	HW Manifests
U133	Waste Hydrazine Aqueous Solution, contains Hydrazine	1	lbs	D, LP	1997	HW Manifests
U147	Waste Corrosive, Acidic, contains Maleic Anhydride	39	lbs	D, LP	1997	HW Manifests
U165	Waste Flammable Solid, Organic, contains Naphthalene	38	lbs	D, LP	1997	HW Manifests
U188	Waste Toxic Solids, Organic, N.O.S., contains Phenol	15	lbs	D	1996	HW Manifests
U196	Waste Flammable Liquid, Corrosive, contains Pyridine	80	lbs	D, LP	1997	HW Manifests
X910	Hazardous and non-hazardous solids	20550	lbs	D	1997	HW Manifests
		20340	lbs	D	1996	HW Manifests
		16250	lbs	D	1996	HW Manifests
ND	Corrosive	3,200	gals	UK	1981	Annual Report

D=Drum HW=Hazardous Waste LP=Labpack ND=Not Designated N.O.S.=Not Otherwise Specified TT=Tank UK=Unknown

APPENDIX C-4

DESCRIPTION OF HISTORIC AND CURRENT WASTE STREAMS

APPENDIX C-4
DESCRIPTION OF HISTORIC AND CURRENT WASTE STREAMS

HAZARDOUS WASTES

Historical and current hazardous wastes generated at the Ganes facility primarily consist of the following:

- pharmaceutical products and by-products in mixed chlorinated and non-chlorinated solvents;
- pharmaceutical impurities;
- spent inventories;
- wastewater sludges accumulated in the settling tank; and
- waste acids from tank cleanout.

Based on manifest and reporting documentation (dated 1981 to 1997), these wastes have been transported to the following facilities for treatment and/or disposal:

All County Environmental
Edgewater, New Jersey
EPA ID #NJT000027821

Delaware Container Co.
Coatesville, Pennsylvania
EPA ID #PAD064375470

Dupont Chambers Works
Deepwater, New Jersey
EPA ID #NJD 002385730

Keystone Portland Cement
Bath, Pennsylvania
EPA ID #PAD00238955

Laidlaw Environmental
Laurel, Maryland
EPA ID #MDD980554653

Marisol, Inc.
Middlesex, New Jersey
EPA ID #NJD002454544

Oldover Corporation
Arvonia, Virginia
EPA ID #VAD098443443

Radiac Research Corporation
Brooklyn, New York
EPA ID #NYD049178296

S & W Waste, Inc.
South Kearny, New Jersey
EPA ID #NJD991291105

Safety-Kleen (Rollins Environmental Services)
Bridgeport, New Jersey
EPA ID #NJD053288239

Safety-Kleen (Solvent Recovery Service)
Linden, New Jersey
EPA ID #NJD002182897

Hazardous wastes generated from the Research and Development Center and the Quality Control lab are stored in 5-gallon containers within the laboratories. Once the containers were full, they were reportedly moved to the hazardous waste storage pad within the GSFP for ultimate disposal off-site.

NON-HAZARDOUS WASTES

- The facility historically stored empty 55-gallon product drums on a gravel pad located at the GSWP. Prior to storage, the drums were emptied and cleaned. Once cleaned, the drums were staged at this location for removal and off-site recycling. The drum cleaning process includes pressure washing the interior of the drums and final dry wiping. The drums are pressure washed outside between Rooms 3 and 4 within close proximity to the neutralization tank. According to site personnel, wastewater from drum cleaning sheet flows directly into the neutralization tank. Currently, Ganes contracts Recycle Inc. East of South Plainfield, New Jersey for drum recycling.

- Non-hazardous solids (i.e. paper, cardboard, plastics) are stored temporarily at various locations within the facility and are transferred to a municipal waste dumpster located within the empty drum storage area of the GSWP.

- Scraps metals and old machinery are stored in the Scharg Warehouse until pickup and recycling.

APPENDIX D

SANITARY AND/OR INDUSTRIAL WASTE (Question 4A)

APPENDIX D-1

DESCRIPTION OF WASTEWATER DISCHARGES

APPENDIX D-1
DESCRIPTION OF WASTEWATER DISCHARGES

CURRENT PROCESS WASTEWATER

The facility maintains an industrial wastewater discharge permit No. 99-0287 effective March 1, 1999 through February 29, 2000 authorized by the Bergen County Utilities Authority BCUA Compliance Department (permit attached as Appendix D-2). Wastewater is discharged through five permitted outfalls to the BCUA Treatment Works via the Borough of Carlstadt sanitary sewer collection system, as denoted on the Drainage Systems Map in Appendix J-3 and detailed below. Outfall 001 is utilized and permitted as an industrial process wastewater discharge point and Outfalls 002 through 005 are permitted as non-contact and sanitary discharge points.

Records were not available regarding time frames for conversion, repair, or upgrading the sites wastewater discharge system to its current layout. Therefore, it was not possible to provide dates of changes to the system. All current wastewater scenarios described below were obtained from limited site maps, site visit observations, employee interviews and permits. A description of each outfall is provided below.

- **Outfall 001**-Discharge from Outfall 001 consists of industrial process wastewater, cooling water and boiler blowdown water, all of which are conveyed via room process trenching, sumps, outside underground piping and overhead piping from wastewater sumps to the neutralization tank for pH adjustment. After neutralization, the wastewater is piped to the settling tank prior to discharge to Outfall 001. Specific wastestreams from rooms 5 and 9 containing high levels of toluene are treated (distilled) prior to entering the neutralization tank. Wastewater exiting Outfall 001 is metered using a V-notch weir with level recorder apparatus. All of the process water trenching throughout the Orchard Street and Garden Street Facility Properties is transferred to the neutralization tank and discharged through Outfall 001. A description of wastewater discharges associated with Outfall 001 identified by room and outside area is provided below.

  Room 1
  Room 1 is currently under construction for conversion to a raw material storage area. Historically Room 1 has been utilized as a manufacturing room. Industrial process wastewater from manufacturing operations was conveyed through open terra-cotta and concrete trenches via gravity feed to an exit point at the southwest corner of Room 1 for direct discharge to the neutralization tank. Approximately 85 linear feet (l.f.) of trenching and one sump (recently removed) are located in Room 1. An inspection of the sump following removal activates during renovation of Room 1 revealed several holes in the sumps steel liner.

  Room 24
  Room 24 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where is exits the west side of the room and ties directly into the neutralization tank. Approximately 75 l.f. of terra-cotta and concrete trenching are located in Room 24. Areas of corrosion and deterioration were observed within the trenching system.

APPENDIX D-1
DESCRIPTION OF WASTEWATER DISCHARGES

Rooms 2, 3, 4, 5, & 6
Rooms 2, 4, 5, and 6 discharge via gravity feed through floor drain systems to Room 3 where the industrial process wastewater is pumped from a sump directly to the neutralization tank. A description of each room is provided below.

Room 2
Room 2 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to the most southeastern corner of the room where it discharges to Room 3 for direct discharge to the neutralization tank. A section of trenching and a sump are located in a below grade section of Room 2 located at the most northerly point of Room 2. Wastewater from this area is discharged directly to a sewer line located in Garden Street. Approximately 1,350 l.f. of terra-cotta and concrete trenching and two concrete sumps are located in Room 2. Areas of corrosion and deterioration were observed within the trenching system.

Room 3
Room 3 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed directly to the neutralization tank. Room 3 also acts as the feeder room for Rooms 2, 4, 5, & 6 for direct discharge to the neutralization tank. Approximately 20 l.f. of terra-cotta and concrete trenching and sump are located in Room 3. Areas of corrosion and deterioration were observed within the trenching system.

Room 4
Room 4 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to Room 3 where it is feed directly to the neutralization tank. Room 4 also acts as the feeder room for Room 5. Approximately 91 l.f. of terra-cotta and concrete trenching and a closed sump are located in Room 4. Areas of corrosion and deterioration were observed within the trenching system.

Room 5
Room 5 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed through Rooms 3 & 4 where it is feed directly to the neutralization tank. Room 5 also acts as the feeder room for Room 6. Toluene laden industrial process wastewater from Room 5 is distilled prior to discharging to Room 4. Approximately 78 l.f. of active and 38 l.f. of closed terra-cotta and concrete trenching are located in Room 5. Areas of corrosion and deterioration were observed within the trenching system. Room 5 also treats (distills) wastewater containing MIBK from Rooms 33 & 26.

Room 6
Room 6 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed through Rooms 5, 4, & 3 where it is feed directly to the neutralization tank. Approximately 78 l.f. of terra-cotta and concrete trenching are located in Room 6. Areas of corrosion and deterioration were observed within the trenching system.

Rooms 7, 8, 9, & 33
Room 7, 8, 9 & 33 discharge industrial process wastewater via gravity feed through process trenching systems that exit each room through the north wall and Room 33 exits through the south wall. Each room ties into an underground process trench that begins at Room 9 and runs along the outside the north end of rooms 7 and 8 and the rear (south) of room 33 to outside of Room 5 where it turns to the neutralization tank for ultimate discharge. A description of each room is provided below.

Room 7
Room 7 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the north side of the room and ties into the main discharge line for ultimate discharge to the neutralization tank. Approximately 110 l.f. of terra-cotta and concrete trenching are located in Room 7. Areas of corrosion and deterioration were observed within the trenching system.

Room 8
Room 8 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the north side of the room and ties into the main discharge line for ultimate discharge to the neutralization tank. Approximately 140 l.f. of terra-cotta and concrete trenching are located in Room 8. Areas of corrosion and deterioration were observed within the trenching system.

Room 9
Room 9 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the north side of the room and ties into the main discharge line for ultimate discharge to the neutralization tank. Toluene laden industrial process wastewater from Room 9 is initially treated using distillation prior to discharging. Approximately 140 l.f. of terra-cotta and concrete trenching are located in Room 9. Areas of corrosion and deterioration were observed within the trenching system.

Room 33
Room 33 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the south side of the room and ties into the main discharge line for

ultimate discharge to the neutralization tank. Also, a portion of wastewater impacted with MIBK is treated (distilled) in Room 5 prior to discharging to the neutralization tank Approximately 72 l.f. of terra-cotta and concrete trenching and two floor drains are located in Room 33. Areas of corrosion and deterioration were observed within the trenching system.

Rooms 20, 21 & 22

Rooms 20 and 21 discharge industrial process wastewater via gravity feed through process trenching systems that exit the northwest wall of Room 20 and discharges to a wastewater sump (~250-gallons) between Rooms 20 and 17. Subsequently, it is pumped via an overhead line to the neutralization tank. A description of each room is provided below.

Room 20

Room 20 has historically been utilized as a manufacturing room and is also the boiler house. Two boilers are located on the eastern half of the room and manufacturing is conducted on the western half of the room. Industrial process wastewater historically generated from the western half of the room directly discharges to the sedimentation tank along with compressor blowdown wastewater from Room 21. Boiler blowdown wastewater generated from the eastern half of the room is conveyed through open terra-cotta and concrete trenches via gravity feed to where it exits the northwest wall of Room 20 and discharges to a wastewater sump (~250-gallons) located between Rooms 20 and 17. The wastewater is pumped from the sump via an overhead line to the neutralization tank. Approximately 77 l.f. of active and 35 l.f. of closed terra-cotta and concrete trenching are located in Room 20. Areas of corrosion and deterioration were observed within the trenching system.

Room 21

Room 21 has historically been utilized as a utility room containing compressors and equipment. Compressor blowdown wastewater is conveyed to a floor drain located in the center of the room. According to site personnel, the floor drain discharges to Room 20 (west side) for direct discharge to the sedimentation tank.

Room 22

Room 22 has historically been utilized as a utility room containing compressors and equipment. Compressor blowdown wastewater historically was conveyed to a floor drain and associate trenches located at the northern end of the room which have since been abandoned in place. Approximately 22 l.f. of closed trenching is located in Room 22.

Room 17

Room 17 is comprised of a ground floor and basement. The ground floor has historically been utilized for manufacturing and the ground floor for storage of equipment and chemicals. The ground floor maintains an industrial process wastewater trenching system that is divided down the center of the room for discharging. The east side of the room discharges to the wastewater sump between Rooms 20 and 17 and the west side discharges to the sump located just outside the eastern wall of Room 17. A closed trenching system and associated floor drain are located in the basement. Also located in the basement is an open unlined sump installed into the subsurface soils and covered with a steel plate (see Photograph No. 23). According to site personnel, an oily liquid was observed at the base of the sump in approximately 1987. The sump appears to have been expanded into the native soil and a pump was placed inside to collect the material into containers for proper disposal off-site. Furthermore, according to site personnel, the oily material was no longer present as of approximately 1990.

Rooms 26, 27, 28, 29, 30, 31, & 32
Room 26 through 31 and 32 discharge industrial process wastewater to Outfall 001. All process wastewater from each of the rooms is ultimately discharged to the sump located in Room 27 where it is pumped via an aboveground line to the neutralization tank. A description of each room is provided below.

Room 26
Room 26 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to the southeast corner of the room where it exits the via a covered trench to Room 27 for ultimate discharge to the neutralization tank. Approximately 128 l.f. of terra-cotta and concrete trenching are located in Room 26. A portion of wastewater impacted with MIBK is treated (distilled) in Room 5 prior to discharging to the neutralization tank. Areas of corrosion and deterioration were observed within the trenching system.

Room 27
Room 27 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to a sump located on the northwest wall for ultimate discharge to the neutralization tank. Room 27 acts as the wastewater collection center for all process rooms on the OSFP. Approximately 113 l.f. of terra-cotta and concrete trenching and an approximately 50-gallon sump are located in Room 27. Areas of corrosion and deterioration were observed within the trenching system.

Room 28
Room 28 has historically been utilized as chemical material storage room. Wastewater has not historically been generated and is only produced during a spill cleanup and according to site personnel no spills or releases have occurred within the room. Approximately 52 l.f. of closed terra-cotta and concrete trenching and one closed floor drain are located in Room 28.

Room 29
Room 29 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed through the northwest wall to Room 27 for ultimate discharge to the neutralization tank. Approximately 88 l.f. of terra-cotta and concrete trenching are located in Room 29. Areas of corrosion and deterioration were observed within the trenching system.

Room 30
Room 30 has historically been utilized as a finished materials storage room/warehouse. Wastewater has not historically been generated and is only produced during a spill cleanup and according to site personnel no spills or releases have occurred within the room. Wastewater if generated is conveyed through open terra-cotta and concrete trench via gravity feed to an underground line to Room 32 for ultimate discharge to the neutralization tank. Approximately 28 l.f. of terra-cotta and concrete trenching are located in Room 30. No areas of corrosion or deterioration were observed within the trenching system.

Room 31
Room 31 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed through the southeast wall to an underground line ultimately to a sump located in Room 32 which ultimately discharge via an aboveground line to the sump located in Room 27 for ultimate discharge to the neutralization tank. Approximately 95 l.f. of terra-cotta and concrete trenching, an approximate 20-gallon sump and cleanout are located in Room 31. Areas of corrosion and deterioration were observed within the trenching system.

Room 32
Room 32 has historically been utilized as a finished materials storage room/warehouse. Wastewater has not historically been generated and is only produced during a spill cleanup and according to site personnel no spills or releases have occurred within the room. Wastewater, if generated, is conveyed through an open terra-cotta and concrete trench via gravity feed to an approximate 50-gallon sump. Wastewater in the sump is pumped via an aboveground line to Room 27's sump for ultimate discharge via an aboveground line to the neutralization tank. Approximately 46 l.f. of terra-cotta and concrete trenching is located in Room 32. No corrosion or deterioration was observed within the trenching system.

- **Outfall 002**-Outfall 002 discharges non-contact water from the wastewater sump located between Rooms 20 and 17 which is utilized only when the non-contact cooling water collection pit sump pump is inoperable and unable to pump wastewater to the neutralization tank. The outfall is only permitted for the discharge of process cooling water.

APPENDIX D-1
DESCRIPTION OF WASTEWATER DISCHARGES

- **Outfall 003**-Outfall 003 consist solely of non-contact water and sanitary wastewater discharged from Rooms 10 through 15 located on the GSFP. Wastewater is conveyed via gravity feed from Room 10 down through Room 15 where it discharges to Outfall 003. A description of wastewater discharges associated with Outfall 003 identified by room is provided below.

  Room 10
  Room 10 has historically been utilized as a repair/maintenance and plumbing shop. Room 10 currently maintains a closed floor drain and active sink. According to available information, the sink currently drains through an underground line which is connected to Room 11 for ultimate discharge to Outfall 003.

  Room 11
  Room 11 has historically been utilized as a chemical storage area, laboratory and pilot plant. Room 11 is currently used as a maintenance shod and maintains two closed floor drains and a closed sump.

  Room 12
  Room 12 has historically been utilized as a laboratory. Room 12 is currently used as office space and is connected to the Quality Control Labs located on the northeast side of the Room.

  Room 13
  Room 13 has historically been utilized as a laboratory. The laboratory is connected to the Quality Control Labs located on the northeast side of Room 13.

  Room 14
  Room 14 has historically been utilized as a laboratory. The laboratory is connected to the Quality Control Labs located on the northeast side of Room 14.

  Room 15
  Room 13 has historically been utilized as locker room, lunch room and rest room. Sanitary wastewater is directly discharged to Outfall 003.

- **Outfall 004**-Outfall 004 consist solely of sanitary wastewater discharges from the office area (Room 26) located at the OSFP.

- **Outfall 005**-Outfall 005 discharges non-contact cooling water from the wastewater sump located in Room 27 and is utilized only when the cooling water collection pit sump pump is inoperable. The outfall, is only permitted for the discharge of process cooling water.

Monitoring and sampling requirements are contained in the attached permit. Samples are collected at a sampling point near the settling tank along Garden Street.

APPENDIX D-1
DESCRIPTION OF WASTEWATER DISCHARGES

STORM WATER

The facility maintains a New Jersey Pollutant Discharge Elimination System/Storm water Discharge Permit No. NJ0104591 which became effective on June 30, 1995 and expired June 30, 1998. A renewal application was filed in January 1998 (permit attached). This permit authorizes the discharge of storm water to the municipal storm water collection system via Outfall DSN 020 and DSN 021, as denoted on the Discharge System Map in Appendix J-3.

Pursuant to the permit, the discharge must be sampled semi-annually. Specific monitoring requirements are contained in the attached permit.

- **Outfalls DSN 020**-Outfall DSN-020 consists solely of storm water from the Garden Street Facility Property. Storm water discharges via sheetflow and roof drains to storm water drains located throughout the area to the settling tank.

  1. The facility maintains a drainage swale that extends northwest of AST 15 (AST tank farm) to outside Room 4 where storm water drains into two storm drains. The storm swale extends approximately 60 feet before entering the storm drains. The storm swale appeared to be in good condition with some corrosion. Access to the storm drains was not possible.

  2. The facility maintains a drainage swale that extends from outside Room 20 down along Room 21 to three storm drains located within the area of the sedimentation tank. The storm swale extends approximately 32 feet before entering the storm drains. The storm swale appeared to be in good condition. Access to the storm drains was not possible. Storm water is reported to enter the sedimentation tank from the storm drains prior to discharge to the City's collection system.

  3. The facility maintains a drainage swale that extends from the entrance gate along Orchard Street to the southwest corner of Room 7 where it ties into a gutter inlet from the roof of Room 7. The storm swale extends approximately 32 feet before extending below grade and reportedly tieing into the process wastewater line associated with (AOC – DS-70) ultimately for discharge to the neutralization tank. The storm swale appeared to be in good condition.

  4. The facility maintains a 96 linear foot open grate storm water trench extending northwest from the northwest corner of Room 33 to the canopy southeast of Room 18. During normal operations, the storm water trench drains storm water to the sump located between Rooms 17 and 20. However, during loading/unloading of hazardous materials in the area, a valve located east or UST-8 is closed in case of a spill or release occurs. If a spill or release occurs, the hazardous material is directed to the sump located outside the northwest corner of Room 33. A pump in the sump pumps the hazardous waste into the AST tank farm secondary containment area. According to site personnel the facility has never had a release or spill during loading/unloading of hazardous materials.

- **Outfalls DSN 021**-Outfall DSN-021 consists solely of storm water from the Orchard Street Facility Property.

   1. Storm water discharges via sheetflow, roof drains and drainage swale and associated vault to Outfall 021 located on the south side of the property along Broad Street. The facility maintains a drainage swale, inlet and vault outside Rooms 29 and 31 of the OSFP. The drainage swale is newly constructed of concrete and extends along a material storage area (AOC – MSA-45) to a vault located in the grassed area.

APPENDIX D-2

INDUSTRIAL WASTEWATER DISCHARGE PERMIT

BERGEN COUNTY UTILITIES AUTHORITY
COMPLIANCE DEPARTMENT
INDUSTRIAL WASTEWATER DISCHARGE PERMIT

Permit No.: 99-0287

Effective Date: 3/1/99

Expiration Date: 2/29/00

Company I.D. No.: 0287

Name and Address of Owner(Permittee): Ganes Chemicals
630 Broad Street
Carlstadt, New Jersey 07072

Location of Activity/Facility: 630 Broad Street
Carlstadt, New Jersey 07072

Type of Business: Pharmaceutical

Type of Permit: Categorical Industry Regulated by 40 CFR Part 439.36
Pharmaceutical Pretreatment Standards For Existing Sources,
Subpart C - Chemical Synthesis Products Subcategory

Flow Category: > 25,000 gpd

Annual Fee: $6,930.00

In accordance with all terms and conditions in the "Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works", the provisions by which are incorporated in this permit, and applicable provisions of Federal and/or State regulation, permission is hereby granted to discharge wastewater from pharmaceutical manufacturing into the Bergen County Utilities Authority Little Ferry Treatment Plant, via the Borough of Carlstadt sanitary sewer collection system, in accordance with wastewater discharge limitations, monitoring requirements, and other requirements set forth in the following tables hereof.

This permit is granted in accordance with the Industrial Wastewater Discharge Permit Application and Questionnaire and accompanying documentation, filed with the Authority, and are considered part of this permit. Industrial Wastewater Discharge Permits are issued for a specific operation. The permittee shall promptly notify the Authority in advance of any changes in operation, process, flow, or discharge. A permit shall not be reassigned or transferred, sold to a new owner, new user, different premises or a new or changed operation without prior written approval of the Authority. If, upon application, the Authority decides that the existing permit can be transferred with no modifications, the succeeding owner or user shall comply with the terms and conditions of the existing permit for the balance of the permit's duration.

Be advised that while the permit is in force, additional information may be required to be submitted and/or discharge limitations may be changed to reflect changes in applicable Federal, State and local regulations. The Permittee hereby agrees to the aforementioned.

Christine LaRocca
Industrial Pretreatment Program Coordinator

Revised 6/1/98

Section 1 - General Conditions

1) The permittee shall not discharge, or allow to be discharged, directly or indirectly into the Authority Treatment Works or local sewer system connected thereto any pollutants or wastewater which:

(A) causes or would cause the influent at the Authority's treatment plant to exceed the following headworks limitations at the Authority's treatment plant:

Pollutant	Headworks Limitation (mg/l)
Arsenic	0.002
Cadmium	0.006
Chromium	0.132
Copper	0.151
Lead	0.189
Mercury	0.002
Nickel	0.138
Silver	0.100
Zinc	0.328
Phenols	0.771

(B) contain prohibited material or substances as specified under the Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works, except upon approval of the Authority, or except as otherwise expressly permitted by Federal or State laws and regulations; or

(C) are not in conformance with the Industrial Wastewater Discharge Permit, administrative order, administrative consent agreement, including interim enforcement limits or other approval issued by the Authority; or

(D) exceed the limitations set forth by EPA pursuant to Section 307 of the Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 466 et seq. or the New Jersey Department of Environmental Protection pursuant to Section 4 of the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.

In no case shall the permittee's discharge have a flow rate or contain concentration of pollutants that exceed, for any fifteen (15) minute period, more than five (5) times the approved daily maximum concentration, flow or mass discharge during normal operation as stated in the Industrial Wastewater Discharge Permit.

(Cont.)

2) The permittee shall not discharge directly or indirectly into the local sewer system or Authority Treatment Works, any wastes or wastewater which cause, threaten to cause, or are capable of causing either alone or by interaction with other substances:

   (A) a fire or explosion hazard, including but not limited to, wastestreams with a closed cup flash point of less than 140 F or 60 C using the test methods specified in 40 CFR 261.21;

   (B) obstruction of flow or injury to the local sewer system or the Authority Treatment Works;

   (C) toxic gases, vapors or fumes that may cause acute health or safety problems of personnel operating or maintaining the system or to the public;

   (D) prevention of the effective operation or maintenance of the local sewer system or the Authority Treatment Works;

   (E) a strong offensive odor or air pollution by the release of toxic or malodorous gases or malodorous gas-producing substances;

   (F) interference with the Authority's treatment plant;

   (G) the Authority's effluent or any other product of the treatment process, residues, sludges, or scums, to be unsuitable for reclamation and reuse or disposal or to interfere with the reclamation and/or disposal process;

   (H) a detrimental environmental impact or a nuisance in the waters of the State or a condition unacceptable to any public agency having regulatory jurisdiction over same or the right to withhold funds as a result thereof;

   (I) discoloration or any other condition in the quality of the Authority Treatment Works effluent such that receiving water quality requirements established by law cannot be met;

   (J) conditions at or near the Authority Treatment Works which violate any statute or any rule, regulation, or ordinance of any public agency, federal, state, county or local regulatory body; or

   (K) the Authority Treatment Works to be overloaded or cause excessive Authority collection or treatment costs.

3) The permittee shall not discharge storm water, groundwater, rain water, street drainage, subsurface drainage, floor or yard drainage, or unpolluted water to any new direct or indirect connections to any separate sanitary sewer in the local sewer system or to the Authority Treatment Works.

4) The permittee shall not discharge storm water, groundwater, rain water, street drainage, subsurface drainage, floor or yard drainage, or unpolluted water through any new direct or indirect connection to any combined sewer system in a local sewer system unless approval is granted by the Authority prior to such discharge. Approval shall be granted when no reasonable alternate method of disposal is available.

(Cont.)

5) The permittee shall not discharge or cause to be discharged, any radioactive material directly or indirectly into the local sewer system or the Authority Treatment Works except:

   (A) when the permittee is authorized to use radioactive materials by the New Jersey Department of Environmental Protection, the United States Nuclear Regulatory Commission or other governmental agency empowered to regulate the use of radioactive materials and,

   (B) when the waste is discharged in strict conformity with current New Jersey Department of Environmental Protection and Energy and United States Nuclear Regulatory Commission regulations and recommendations for safe disposal, and when the permittee is in compliance with all rules and regulations of all other applicable regulatory agencies.

6) The permittee shall not discharge waste from garbage grinders directly or indirectly to the local sewer system or the Authority Treatment Works through any new connection except:

   (A) wastes generated in preparation of food normally consumed on the premises; or

   (B) where the permittee has obtained approval for that specific use from the Authority and agrees to undertake whatever self-monitoring is required to enable the Authority to equitably determine the charges and fees based on the waste constituents and characteristics. An approved access point for monitoring and sampling sewage must be made available by the permittee.

   Such grinders must shred the waste to a degree that the discharge is shredded so that all particles will be carried freely under normal flow conditions prevailing in the local sewer system or the Authority Treatment Works. Plastic, glass, rags, paper or wood products, inert materials, garden refuse or any other commercial or industrial solid wastes shall not be discharged through a garbage grinder directly or indirectly to the local sewer system or the Authority Treatment Works.

7) The permittee shall not make any new connections to the local sewer system or discharge any wastes directly or indirectly to the local sewer system through any new connection unless such connection has been approved by the Executive Director except indirect 4" residential lateral connections. The permittee shall not discharge any substances directly into a manhole or other opening leading to the local sewer system or the Authority Treatment Works that was not designed or intended to receive such wastes, unless the Authority approves such discharge and the discharge location.

8) The permittee shall not discharge any holding tank wastes directly or indirectly to the local sewer system or the Authority Treatment Works through any connection unless he has received approval from the Authority.

(Cont.)

9) The permittee shall not discharge directly or indirectly to the local sewer system or the Authority Treatment Works any wastes or wastewater having heat in amounts which will inhibit the biological activity at the Authority's Treatment Plant, but in no case shall the wastewater temperature at the Treatment Plant exceed 40 degrees C (104 degrees F).

10) Any effluent limitations and other requirements promulgated by the United States Environmental Protection Agency, the New Jersey Department of Environmental Protection, or any other governmental entity having jurisdiction shall apply in any instance where they are more stringent than those set forth in this permit. The Authority may also supplement this permit with more stringent requirements if it determines that this permit:

    (A) may not be sufficient to enable the Authority to comply with the standards and limitations specified in the Authority's National or New Jersey Pollutant Discharge Elimination System Permit

    (B) may not adequately limit the wastes received into the Authority Treatment Works so as to prevent interference pass through, or impeding of operations or so as to allow the disposal or sales of solids or sludges or the recovery of by-products or energy therefrom.

11) When the Authority shall prohibit, establish pretreatment standards, or otherwise limit the discharge of any substance or pollutant, the permittee will be required to modify the discharge of the substances to the sewers to the levels so prescribed.

    The permittee shall not increase the use of process or cooling water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in the National Categorical Pretreatment Standards, or in any other pollutant-specific limitation developed by the Authority or NJDEP.

12) Connections to the local sewer system shall be designed and constructed to conform to the requirements and procedures set forth in the Authority's "Standards for Connection to Authority Sewers and Related Requirements" (Appendix A) of the Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works and all applicable State and local building and plumbing codes. All such connections shall be subject to the inspection and approval of the Authority.

13) Record-keeping requirements.
    (A) Permittee shall maintain records of all information resulting from any monitoring activities required by this permit. Such records shall include for all samples:
        (i) The date, exact place, method, and time of sampling and the names of the person or persons taking the samples;
        (ii) The dates analyses were performed;

(Cont.)

(iii)Who performed the analyses;
(iv) The analytical techniques/methods use; and
(v) The results of such analyses.

(B) Permittee shall be required to retain for a minimum of 5 years any records of monitoring activities and results (whether or not such monitoring activities are required by this permit and shall make such record available for inspection and copying by the Authority and NJDEP. This period of retention shall be extended during the course of any unresolved litigation regarding the permittee or when requested by the Authority or NJDEP.

14) Permittee shall notify the Authority immediately of all discharges that could cause problems to the Authority's treatment works including any slug loadings. A slug loading is any discharge of a non-routine episodic nature including, but not limited to an accidental spill or a non-customary batch discharge.

A notice shall be permanently posted on the bulletin board or other prominent place advising all employees of the responsible person to call in the event of an accidental or non-compliance discharge. This person shall be responsible for initiating emergency notification procedures in accordance with this paragraph and paragraph 19. Permittees shall insure that all employees, who could cause such an accidental or non-compliance discharge to occur, are advised of the emergency notification procedure.

15) The permittee shall notify the Authority, the USEPA Regional Waste Management Division Director, and NJDEP in writing of any discharge into the Authority's Treatment Works, Intercepting Sewer or Local Sewer of a substance, which, if otherwise disposed of, would be a hazardous waste under 40 CFR Part 261. Such notification must include the name of the hazardous waste as set forth in 40 CFR Part 261, the USEPA hazardous waste number, and the type of discharge (continuous, batch, or other). If the permittee discharges more than 100 kilograms of such waste per calendar month to the Authority's Treatment Works, Intercepting Sewer or Local Sewers, the notification shall also contain the following information to the extent such information is known and readily available to the permittee: An identification of the hazardous constituents contained in the wastes, an estimation of the mass and concentration of such constituents in the wastestream discharged during that calendar month, and an estimation of the mass of constituents in the wastestream expected to be discharged during the following twelve months. All notifications for existing sources must take place within 180 days after the discharge of the listed or characteristic hazardous waste. Any notification under this paragraph need be submitted only once for each hazardous waste discharged. However, notifications of changed discharges must be submitted in accordance with Paragraph 19)E. The notification requirement in this section does not apply to pollutants already reported under the self-monitoring requirements of Section 3.

16) Dischargers are exempt from the requirements of paragraph 15 during a calendar month in which they discharge no more than fifteen kilograms of hazardous wastes, unless the wastes are acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e). Discharge of more than fifteen kilograms of non-acute hazardous wastes in a calendar month, or of any quantity of acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e) requires a one-time notification.

Subsequent months during which the Industrial User discharges more than such quantities of any hazardous waste do not require additional notification.

17) In the case of any new regulations under section 3001 of RCRA identifying additional characteristics of hazardous waste or listing any additional substance as a hazardous waste, the Industrial User must notify the Authority, the EPA Regional Waste Management Waste Division Director, and NJDEP of the discharge of such substance within ninety (90) days of the effective date of such regulations.

18) In the case of any notification made under paragraph 15, the Industrial User shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical.

19) Permittee shall provide additional self monitoring reports as follows:

A. Report any exceedance of an effluent limitation that causes injury to persons, or damage to the environment, or poses a threat to human health or the environment, within two (2) hours of its occurrence, or of the permittee becoming aware of its occurrence.

B. Within twenty-four (24) hours of an event described in A. above, or of an exceedance, or of becoming aware of an exceedance, of an effluent limitation for a toxic pollutant, a permittee shall provide such additional information on the discharge as may be required by the Authority, including an estimate of the danger posed by the discharge to the environment, whether the discharge is continuing and the measures taken, or being taken, to remediate the problem and any damage to the environment, and to avoid a repetition of the problem.

C. A permittee shall be required to file monthly reports if the permittee:

(1) in any month commits a serious Violation or fails to submit a completed discharge monitoring report and such failure to report continues unabated following thirty (30) days notice from the Authority; or

(2) exceeds an effluent limitation for the same pollutant at the same discharge point source by any amount for four (4) out of six (6) consecutive months (in the case of a permittee who files monthly reports); or for one report (in the case of a permittee who files reports at quarterly, bi-yearly or yearly intervals).

(Cont.)

The monthly reporting requirement shall apply to those constituents which triggered the violations noted in Paragraph 19 (1) and (2) above. The reporting requirements stipulated in the permit shall be restored if the permittee has not committed any of the violations identified in Paragraph 19 (C) (1) and (2) above for six (6) consecutive months. The term "Serious Violation" shall be as defined in Article II of the Authority's Rules and Regulations.

D. A permittee shall report to the Authority any Serious Violation within thirty (30) days of the violation, together with a statement explaining the nature of the serious violation and the measures taken to remedy the cause or prevent a recurrence of the serious violation.

E. A permittee shall notify the Authority in advance of the quality and quantity of all new introduction of pollutants into the Authority's Treatment Works or a local sewer system and of any substantial change in the pollutants introduced into a facility by an existing user of the facility. The notification shall estimate the effects of the changes on the effluents to be discharged into the facility.

20) The Authority shall have the right of entry to all premises in which a discharge source is or might be located or in which monitoring equipment or records required by a permit are kept, for purposes of inspection, sampling, copying or photographing.

21) The Authority shall have the right to perform an inspection and sample the effluent of a permittee at such times and at such frequencies as the Authority deems necessary to confirm compliance with pretreatment requirements.

22) Wastewater discharge permits may be transferred to a new owner or operator only if permittee gives at least thirty (30) days advance notice to Industrial Pretreatment Coordinator and Industrial Pretreatment Coordinator approves the wastewater discharge permit transfer. The notice to Industrial Pretreatment Coordinator must include a written certification by the new owner or operator which:

A) States that the new owner and/or operator has no immediate intent to change the facility's operations and processes;

B) Identifies the specific date on which the transfer is to occur; and

C) Acknowledges full responsibility for complying with the existing wastewater discharge permit.

23) All Industrial Wastewater permits issued to a particular user are void upon the issuance of a new Industrial Wastewater Permit to that user.

Section 2 - Discharge Limitations

Local Pretreatment Limits

Hazardous limits:

Parameter	Limitation (mg/l)
Acrolein	0.30
Acrylonitrile	8.40
Benzene	0.85
Bromoform	1.00
Carbon Tetrachloride	0.15
Chlorobenzene	10.60
Chloroethane	21.50
Chloroform	1.75
1,2-Dichlorobenzene	21.60
1,4-Dichlorobenzene	26.30
1,1-Dichloroethane	19.40
1,2-Dichloroethane	4.50
1,1-Dichloroethylene	0.14
1,2-Trans Dichloroethylene	17.00
1,2-Dichloropropane	21.20
Ethyl Benzene	9.30
Methylene Chloride	17.00
1,1,2,2-Tetrachloroethane	3.85
Tetrachloroethylene	1.80
Toluene	8.10
1,1,1-Trichloroethane	65.00
1,1,2-Trichloroethane	8.60
Trichloroethylene	3.30
Trichlorofluoromethane	6.25
Vinyl Chloride	0.00024*

*Limit to be set at current detection limit of 0.002 mg/l.

Copper (T)	1.0 mg/l Daily Maximum
Cyanide	** 0.50 mg/l Daily Maximum
Oil or Grease Petroleum origin	100 mg/l Monthly Average 150 mg/l Single Sample
Explosivity	5% LEL any 2 successive Readings 10% LEL any 1 reading

Non-hazardous limits:

Biochemical Oxygen Demand, BOD	BCUA must be notified if over 350 mg/l
Suspended Solids, S.S.	BCUA must be notified if over 350 mg/l
pH	5.5 - 9.5 Daily Range
Oil or Grease Non-petroleum origin	200 mg/l Daily Maximum

Note:
(T) = Total
** = Categorical limit replaced by a more stringent local limit.

Section 3 - Monitoring Schedule

The company being Ganes Chemicals, shall monitor its effluent wastestream per the following schedule. All sampling and analysis shall be performed in accordance with 40 CFR Part 136 or the approved equivalent method.

Samples taken in compliance with the specified monitoring requirements shall be taken at the following location: **Discharge Point on Garden Street.**

Monthly Monitoring

Parameter	Sample Type	Sample Frequency	Monitoring Frequency
pH	Continuous	Continuous	Continuous
Biochemical Oxygen Demand	Composite	24 Hours	One Day per Month
Suspended Solids	Composite	24 Hours	One Day per Month
Oil and Grease Total	Grab	1 per 24 Hours	One Day per Month
Oil and Grease Petroleum Hydorcarbons	Grab	1 per 24 Hours	One Day per Month
Total Volatile Organics (Method 624)	Grab	1 per 24 Hours	One Day per Month
*Cyanide (T)	Grab	1 per 24 Hours	One Day per Month

Note:
(T) = Total

* In lieu of monitoring for cyanide you may certify to the Authority in writing that you do not use nor generate this compound, in accordance with 40 CFR Part 439.36 (a) (2).

Section 4 - Monitoring Requirements

Not later than fourteen (14) days following each month in the Monitoring Schedule the industrial user shall submit to Bergen County Utilities Authority a compliance report consisting at minimum of the following items:

1) Any change in company name, ownership, contact person or authorized representative changed;

2) Average and maximum daily regulated wastewater flow, with an explanation of how obtained (flow meter, volume displacement, water bills, etc.);

3) An accounting of each pollutant required by Section 3 - Monitoring Schedule either by analysis or by statement of non-use. In addition, if any pollutant is monitored more frequently than required by Section 3 - Monitoring Schedule, the results of this monitoring shall also be included;

4) Chain of custody identifying the duration of composite samples (start and finish) and sampling time for grab samples;

5) The name, address and identification number of the NJDEP certified laboratory that performed the analysis;

6) A statement of compliance or a compliance schedule in the event of non-compliance; and,

7) A certification from an authorized representative of the permittee which states:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

BY:____________________ __________________________."

Signature Name and Title (typed)

Section 5 - Statement of Penalties

The Authority may take any and all actions and pursue any and all remedies permitted by federal law and the laws of the State of New Jersey to enforce the provisions of the "Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works".

These actions and remedies shall include, but not necessarily be limited to those set forth in Article VI of the "Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works". Wherever in Article VI reference is made by title to any official or employee of the Authority, it shall be understood that such official or employee shall act as the duly appointed representative of the Executive Director. The Executive Director shall at all times have the right to undertake any action delegated to such official or employee or authorize other authority officials or employees to undertake such delegated duties as well.

Enforcement Actions available to the Authority include, but are not necessarily limited to, the following:

(A) Issue an order to comply in accordance with the provisions of Section 10 of P.L. 1977, c.74 (N.J.S. 58:10A-10);

(B) Bring a civil action in accordance with the provisions of Section 10 of P.L. 1977, c.74 (N.J.S. 58:10A-10);

(C) Issue a summons in accordance with the provisions of Section 1 of P.L. 1991, c.8 (N.J.S. 58:10A-10.4);

(D) Issue a civil administrative penalty in accordance with the provisions of Section 2 of P.L. 1991, c.8 (N.J.S. 58:10A-10.5);

(E) Bring an action for a civil penalty in accordance with the provisions of Section 10 of P.L. 1977, c.74 (N.J.S. 58:10A-10);

(F) Petition for the commencement of a criminal action in accordance with the provisions of Section 10 of P.L. 1977, c.74(N.J.S. 58:10A-10);

(G) Seek injunctive relief against a violation or threatened violation in accordance with the provisions of Section 7 of P.L. 1972, c.42, as amended by Section 18 of P.L. 1990,c.28(N.J.S.58:11-55); and

(H) Seal or close off sewerage connections in accordance with the provisions of Section 8 of P.L. 1972,c.42(N.J.S.58:11-56).

In the event of a violation of any rule, regulation or pretreatment standard adopted by the Authority, the Authority shall take one of the enforcement actions set forth above or obtain injunctive relief against the violation. If applicable, the Authority shall assess civil administrative penalties in amounts no less than the minimums set forth in P.L. 1990, c.28, section 6 (N.J.S. 58:10-10.1). Nothing contained in this section shall be construed to prohibit or otherwise limit the Authority from pursuing any other remedy permitted by federal law and the laws of the State of New Jersey.

FACT SHEET

INDUSTRIAL WASTEWATER DISCHARGE PERMIT TO DISCHARGE TO THE BERGEN COUNTY UTILITIES AUTHORITY TREATMENT WORKS

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Ganes Chemicals
611 Broad Street
Carlstadt, New Jersey 07072

TYPE OF PERMIT: Categorical Industry Regulated by 40 CFR 439.36, Pharmaceutical Pretreatment Standards for Existing Sources, Subpart C - Chemical Synthesis Products Subcategory

SIC CODES: 2833

FLOW CATEGORY: > 25,000 gpd

AVERAGE DAILY FLOW RATE: 37,500 gpd

DESCRIPTION OF FACILITY OPERATIONS:

Ganes Chemicals is a manufacturer of active pharmaceutical ingredients and intermediates.

PRETREATMENT: pH Neutralization

DESCRIPTION OF SAMPLING POINT: Collection pit on Garden Street. The combined wastestream formula was not utilized for this facility, the more stringent local limit replaces the categorical limit for cyanide.

SAMPLING PARAMETERS:

Cyanide, pH, Biochemical Oxygen Demand, Suspended Solids, Oil and Grease (Total), Oil and Grease (Petroleum Hydrocarbons), Total Volatile Organics.

Cyanide must be monitored in accordance with the Pharmaceutical Standards. In lieu of monitoring for cyanide the permittee may certify non use. The remaining pollutants were selected for self-monitoring because historical data reveals that they have the potential to be in the discharge.

STATEMENT OF BASIS:

Categorical limits are in accordance with 40 CFR 439.36, Pharmaceutical Pretreatment Standards for Existing Sources, Subpart C - Chemical Synthesis Subcategory. Cyanide has categorical limits replaced by a more stringent local limit. In addition, Section 1 - General Conditions and Section 2 - Discharge Limitations of the Industrial Wastewater Discharge Permit are in accordance with the General Pretreatment Regulations, 40 CFR 403.6 and the Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Work, adopted October 1994.

Wastewater Discharge Permit

Permit Information:

- Permit #: 98-0287
- Description: Permit to discharge industrial wastewater to sanitary sewer
- Agency: Bergen County Utilities Authority (BCUA)
- Duration: 1 Year

Current Permit:

- Effective: March 1, 1998
- Expires: February 28, 1999
- Renewal: Automatically renewal following comment period on draft permit.
- Inspections: Periodic announced and unannounced inspections and sample collection
- Sampling: Samples are collected and analyzed for the following once per month:
  - Biochemical Oxygen Demand – 24 hour composite
  - Total suspended Solids – 24 hour composite
  - Oil & Grease - grab
  - Total Petroleum Hydrocarbons - grab
  - Total Volatile Organics - grab
  - Total Cyanide - grab
- Monitoring: The following parameters are monitored continuously:
  - Flow
  - pH
- Reporting: Self Monitoring Report, sample results, and pH recording charts submitted to BCUA once per month.

Local Pretreatment Limits

Hazardous limits:

Parameter	Limitation (mg/l)
Acrolein	0.30
Acrylonitrile	8.40
Benzene	0.85
Bromoform	1.00
Carbon Tetrachloride	0.15
Chlorobenzene	10.60
Chloroethane	21.50
Chloroform	1.75
1,2-Dichlorobenzene	21.60
1,4-Dichlorobenzene	26.30
1,1-Dichloroethane	19.40
1,2-Dichloroethane	4.50
1,1-Dichloroethylene	0.14
1,2-Trans Dichloroethylene	17.00
1,2-Dichloropropane	21.20
Ethyl Benzene	9.30
Methylene Chloride	17.00
1,1,2,2-Tetrachloroethane	3.85
Toluene	8.10
1,1,1-Trichloroethane	65.00
1,1,2-Trichloroethane	8.60
Trichloroethylene	3.30
Trichlorofluoromethane	6.25
Vinyl Chloride	0.00024*

*Limit to be set at current detection limit of 0.002 mg/l.

Copper (T)	1.0 mg/l Daily Maximum
Cyanide	0.50 mg/l Daily Maximum
Oil or Grease Petroleum origin	100 mg/l Monthly Average 150 mg/l Single Sample
Explosivity	5% LEL any 2 successive Readings 10% LEL any 1 reading

Non-hazardous limits:

Biochemical Oxygen Demand, BOD	BCUA must be notified if over 350 mg/l
Suspended Solids, S.S.	BCUA must be notified if over 350 mg/l
pH	5.5 - 9.5 Daily Range
Oil or Grease Non-petroleum origin	200 mg/l Daily Maximum

Note:
(T) = Total

FACT SHEET

FOR THE INDUSTRIAL WASTEWATER DISCHARGE PERMIT TO DISCHARGE WASTEWATER TO THE BERGEN COUNTY UTILITIES AUTHORITY TREATMENT WORKS

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Ganes Chemicals
611 Broad Street
Carlstadt, New Jersey 07072

TYPE OF PERMIT: Categorical Industry Regulated by 40 CFR 439.46, Pharmaceutical Pretreatment Standards for Existing Sources

SIC CODES: 2833

FLOW CATEGORY: > 25,000 gpd

AVERAGE DAILY FLOW RATE: 152,000 gpd

DESCRIPTION OF FACILITY OPERATIONS:

Ganes Chemicals manufactures bulk medicinal chemicals by dry and liquid blending and mixing.

PRETREATMENT: pH Neutralization, Cyanide Destruction, Ammonia Treatment

DESCRIPTION OF SAMPLING POINT: Collection pit on Garden Street.
The combined wastestream formula was not utilized for this facility, the more stringent local limit replaces the categorical limit for cyanide.

SAMPLING PARAMETERS:

Cyanide, pH, Biochemical Oxygen Demand, Suspended Solids, Oil and Grease (Total), Oil and Grease (Petroleum Hydrocarbons), Total Volatile Organics.

STATEMENT OF BASIS:

Categorical limits are in accordance with 40 CFR 439.46, Pharmaceutical Pretreatment Standards for Existing Sources. Cyanide has categorical limits replaced by a more stringent local limit. In addition, General Conditions are in accordance with the General Pretreatment Regulations, 40 CFR 403.6. The permittee is also subject to the local limits incorporated in the <u>Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Work</u>, adopted October 1994.

Notice of Authorization

Permit No.:	Issuance Date:	Effective Date:	Expiration Date:
98-0287	3/1/98	3/1/98	2/28/99

Issued to:	For Activity/Facility at:	Owner:	Type of Business:
Ganes Chemicals	611 Broad Street Carlstadt, N.J. 07072	611 Broad Street Carlstadt, N.J. 07072	Pharmaceuticals

Issued By:	Type of Permit:
Compliance Department	Categorical 40 CFR Part 439.36 Subpart C

A Permit To:

Discharge process wastewater from pharmaceutical manufacturing into the Bergen County Utilities Authority Little Ferry Treatment Plant, via the Borough of Carlstadt sanitary sewer collection system, in accordance with wastewater discharge limitations, monitoring requirements, and other requirements set forth in the permit on file at the facility.

Christine LaRocca

BCUA Authorization
Christine LaRocca, IPP Coordinator

BCUA Spill Emergency or Non-Compliance Notification
Hotline (201) 641-2552 (24 hrs. a day, 7 days per week.)

BERGEN COUNTY UTILITIES AUTHORITY

THIS NOTICE MUST BE CONSPICUOUSLY DISPLAYED AT THE ACTIVITY/FACILITY SITE.

Physical Connection Permit

Permit Information:

- Permit #: 0900
- Description: Permit to ensure proper installation and operation of three Backflow Prevention Devices (1 in the basement of the R&D building and two in Room 8)
- Agency: New Jersey Department of Environmental Protection Water Supply Element
- Permit Duration: 1 Year

Current Permit:

- Permit Effective: April 1, 1998
- Permit Expires: March 31, 1999
- Permit Renewal: Awaiting annual fee and renewal notice
- Inspections: Quarterly testing of backflow prevention devices by certified tester
- Reporting: Annual submission of quarterly Test and Maintenance Report Forms with the Permit Renewal Application Form.

Let's protect our earth

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER SUPPLY ELEMENT
BUREAU OF SAFE DRINKING WATER
CN 426, Trenton, N.J. 08625-0426

PERMIT*

The New Jersey Department of Environmental Protection and Energy grants this permit in accordance with your application, attachments accompanying same application and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No.	Issuance Date	Effective Date	Expiration Date
0900	March 27, 1992	April 1, 1998	March 31, 1999

Name and Address of Applicant	Location of Activity/Facility	
Ganes Chemicals, Incorporated 630 Broad Street Carlstadt, N.J. 07072	Carlstadt Borough 611-641 Broad St. & 418 Orchard St.	
	Type of Permit	**Statute(s)**
	RENEWAL PHYSICAL CONNECTION PERMIT	N.J.A.C. 7:10-10.1 et seq.

This permit grants permission to: Maintain, own and operate a Physical Connection between an approved Public Community Water System and an Unapproved Water Supply at the above named location, in consideration of the renewal permit application received, May 27, 1998.

Number, Type and size of Backflow Preventor Valves Permitted - Two 2 inch & one 3 inch RPZs

Owner of Approved Public Water System - United Water New Jersey
Local Administrative Authority - Mid-Bergen Reg Hlth Comm
Source of Unapproved Water Supply - Private Well

This Permit is subject to the Following Specific Conditions:

1. The above listed valves, shall be tested for tightness, under prevailing pressure conditions at least once every three months. NJAC 7:10-10.6(a)1.

2. The above listed valves, shall be disassembled and internally inspected for integrity of the internal machanism, within six months prior to the for submission of an application for permit renewal. NJAC 7:10-10.6(a)2. *A Reduced Pressure Zone (RPZ) valve shall not be subject to the internal inspection except as provided in NJAC 7:10-10.6(a)4.*

3. The owner of the facility where the physical connection exists shall either arrange for witnessing of these tests and annual internal inspection with a represenaitve of the supplier of water and/or the local administrative authority, or shall use a certified tester who holds a valid backflow prevention device testers certificate issued by a certifying agency approved by the Department, as per NJAC 7:10-10.8(f).

4. Upon completion of each test and inspection, the permit holder shall have the results and certifications of those present recorded on the Quarterly Test and Maintenance Report Form. And prior to expiration of this permit complete the Physical Connection Permit Renewal Application Form and submit it to the Department with all the Quarterly Test and Maintenance Report forms from the preceding permit year as per NJAC 7:10-10.5(b).

cc: United Water New Jersey
Mid-Bergen Reg Hlth Comm

Approved by the authority of:

Water Supply Element

Barker Hamill, Bureau Chief

* The word permit means "approval, certification, registration".

(GENERAL CONDITIONS ARE ON THE REVERSE SIDE.)

BERGEN COUNTY UTILITIES AUTHORITY
COMPLIANCE DEPARTMENT
<u>INDUSTRIAL WASTEWATER DISCHARGE PERMIT</u>

Permit No.: 99-0287

Effective Date: 3/1/99

Expiration Date: 2/29/00

Company I.D. No.: 0287

Name and Address of Owner(Permittee): Ganes Chemicals
630 Broad Street
Carlstadt, New Jersey 07072

Location of Activity/Facility: 630 Broad Street
Carlstadt, New Jersey 07072

Type of Business: Pharmaceutical

Type of Permit: Categorical Industry Regulated by 40 CFR Part 439.36 Pharmaceutical Pretreatment Standards For Existing Sources, Subpart C - Chemical Synthesis Products Subcategory

Flow Category: > 25,000 gpd

Annual Fee: $6,930.00

In accordance with all terms and conditions in the "Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works", the provisions by which are incorporated in this permit, and applicable provisions of Federal and/or State regulation, permission is hereby granted to discharge wastewater from pharmaceutical manufacturing into the Bergen County Utilities Authority Little Ferry Treatment Plant, via the Borough of Carlstadt sanitary sewer collection system, in accordance with wastewater discharge limitations, monitoring requirements, and other requirements set forth in the following tables hereof.

This permit is granted in accordance with the Industrial Wastewater Discharge Permit Application and Questionnaire and accompanying documentation, filed with the Authority, and are considered part of this permit. Industrial Wastewater Discharge Permits are issued for a specific operation. The permittee shall promptly notify the Authority in advance of any changes in operation, process, flow, or discharge. A permit shall not be reassigned or transferred, sold to a new owner, new user, different premises or a new or changed operation without prior written approval of the Authority. If, upon application, the Authority decides that the existing permit can be transferred with no modifications, the succeeding owner or user shall comply with the terms and conditions of the existing permit for the balance of the permit's duration.

Be advised that while the permit is in force, additional information may be required to be submitted and/or discharge limitations may be changed to reflect changes in applicable Federal, State and local regulations. The Permittee hereby agrees to the aforementioned.

Christine LaRocca
Industrial Pretreatment Program Coordinator

Section 1 - General Conditions

1) The permittee shall not discharge, or allow to be discharged, directly or indirectly into the Authority Treatment Works or local sewer system connected thereto any pollutants or wastewater which:

(A) causes or would cause the influent at the Authority's treatment plant to exceed the following headworks limitations at the Authority's treatment plant:

Pollutant	Headworks Limitation (mg/l)
Arsenic	0.002
Cadmium	0.006
Chromium	0.132
Copper	0.151
Lead	0.189
Mercury	0.002
Nickel	0.138
Silver	0.100
Zinc	0.328
Phenols	0.771

(B) contain prohibited material or substances as specified under the Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works, except upon approval of the Authority, or except as otherwise expressly permitted by Federal or State laws and regulations; or

(C) are not in conformance with the Industrial Wastewater Discharge Permit, administrative order, administrative consent agreement, including interim enforcement limits or other approval issued by the Authority; or

(D) exceed the limitations set forth by EPA pursuant to Section 307 of the Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 466 et seq. or the New Jersey Department of Environmental Protection pursuant to Section 4 of the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq.

In no case shall the permittee's discharge have a flow rate or contain concentration of pollutants that exceed, for any fifteen (15) minute period, more than five (5) times the approved daily maximum concentration, flow or mass discharge during normal operation as stated in the Industrial Wastewater Discharge Permit.

(Cont.)

2) The permittee shall not discharge directly or indirectly into the local sewer system or Authority Treatment Works, any wastes or wastewater which cause, threaten to cause, or are capable of causing either alone or by interaction with other substances:

(A) a fire or explosion hazard, including but not limited to, wastestreams with a closed cup flash point of less than 140 F or 60 C using the test methods specified in 40 CFR 261.21;

(B) obstruction of flow or injury to the local sewer system or the Authority Treatment Works;

(C) toxic gases, vapors or fumes that may cause acute health or safety problems of personnel operating or maintaining the system or to the public;

(D) prevention of the effective operation or maintenance of the local sewer system or the Authority Treatment Works;

(E) a strong offensive odor or air pollution by the release of toxic or malodorous gases or malodorous gas-producing substances;

(F) interference with the Authority's treatment plant;

(G) the Authority's effluent or any other product of the treatment process, residues, sludges, or scums, to be unsuitable for reclamation and reuse or disposal or to interfere with the reclamation and/or disposal process;

(H) a detrimental environmental impact or a nuisance in the waters of the State or a condition unacceptable to any public agency having regulatory jurisdiction over same or the right to withhold funds as a result thereof;

(I) discoloration or any other condition in the quality of the Authority Treatment Works effluent such that receiving water quality requirements established by law cannot be met;

(J) conditions at or near the Authority Treatment Works which violate any statute or any rule, regulation, or ordinance of any public agency, federal, state, county or local regulatory body; or

(K) the Authority Treatment Works to be overloaded or cause excessive Authority collection or treatment costs.

3) The permittee shall not discharge storm water, groundwater, rain water, street drainage, subsurface drainage, floor or yard drainage, or unpolluted water to any new direct or indirect connections to any separate sanitary sewer in the local sewer system or to the Authority Treatment Works.

4) The permittee shall not discharge storm water, groundwater, rain water, street drainage, subsurface drainage, floor or yard drainage, or unpolluted water through any new direct or indirect connection to any combined sewer system in a local sewer system unless approval is granted by the Authority prior to such discharge. Approval shall be granted when no reasonable alternate method of disposal is available.

(Cont.)

5) The permittee shall not discharge or cause to be discharged, any radioactive material directly or indirectly into the local sewer system or the Authority Treatment Works except:

(A) when the permittee is authorized to use radioactive materials by the New Jersey Department of Environmental Protection, the United States Nuclear Regulatory Commission or other governmental agency empowered to regulate the use of radioactive materials and,

(B) when the waste is discharged in strict conformity with current New Jersey Department of Environmental Protection and Energy and United States Nuclear Regulatory Commission regulations and recommendations for safe disposal, and when the permittee is in compliance with all rules and regulations of all other applicable regulatory agencies.

6) The permittee shall not discharge waste from garbage grinders directly or indirectly to the local sewer system or the Authority Treatment Works through any new connection except:

(A) wastes generated in preparation of food normally consumed on the premises; or

(B) where the permittee has obtained approval for that specific use from the Authority and agrees to undertake whatever self-monitoring is required to enable the Authority to equitably determine the charges and fees based on the waste constituents and characteristics. An approved access point for monitoring and sampling sewage must be made available by the permittee.

Such grinders must shred the waste to a degree that the discharge is shredded so that all particles will be carried freely under normal flow conditions prevailing in the local sewer system or the Authority Treatment Works. Plastic, glass, rags, paper or wood products, inert materials, garden refuse or any other commercial or industrial solid wastes shall not be discharged through a garbage grinder directly or indirectly to the local sewer system or the Authority Treatment Works.

7) The permittee shall not make any new connections to the local sewer system or discharge any wastes directly or indirectly to the local sewer system through any new connection unless such connection has been approved by the Executive Director except indirect 4" residential lateral connections. The permittee shall not discharge any substances directly into a manhole or other opening leading to the local sewer system or the Authority Treatment Works that was not designed or intended to receive such wastes, unless the Authority approves such discharge and the discharge location.

8) The permittee shall not discharge any holding tank wastes directly or indirectly to the local sewer system or the Authority Treatment Works through any connection unless he has received approval from the Authority.

9) The permittee shall not discharge directly or indirectly to the local sewer system or the Authority Treatment Works any wastes or wastewater having heat in amounts which will inhibit the biological activity at the Authority's Treatment Plant, but in no case shall the wastewater temperature at the Treatment Plant exceed 40 degrees C (104 degrees F).

10) Any effluent limitations and other requirements promulgated by the United States Environmental Protection Agency, the New Jersey Department of Environmental Protection, or any other governmental entity having jurisdiction shall apply in any instance where they are more stringent than those set forth in this permit. The Authority may also supplement this permit with more stringent requirements if it determines that this permit:

    (A) may not be sufficient to enable the Authority to comply with the standards and limitations specified in the Authority's National or New Jersey Pollutant Discharge Elimination System Permit

    (B) may not adequately limit the wastes received into the Authority Treatment Works so as to prevent interference pass through, or impeding of operations or so as to allow the disposal or sales of solids or sludges or the recovery of by-products or energy therefrom.

11) When the Authority shall prohibit, establish pretreatment standards, or otherwise limit the discharge of any substance or pollutant, the permittee will be required to modify the discharge of the substances to the sewers to the levels so prescribed.

    The permittee shall not increase the use of process or cooling water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in the National Categorical Pretreatment Standards, or in any other pollutant-specific limitation developed by the Authority or NJDEP.

12) Connections to the local sewer system shall be designed and constructed to conform to the requirements and procedures set forth in the Authority's "Standards for Connection to Authority Sewers and Related Requirements" (Appendix A) of the Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works and all applicable State and local building and plumbing codes. All such connections shall be subject to the inspection and approval of the Authority.

13) Record-keeping requirements.
    (A) Permittee shall maintain records of all information resulting from any monitoring activities required by this permit. Such records shall include for all samples:
        (i) The date, exact place, method, and time of sampling and the names of the person or persons taking the samples;
        (ii) The dates analyses were performed;

(Cont.)

(iii) Who performed the analyses;
(iv) The analytical techniques/methods use; and
(v) The results of such analyses.

(B) Permittee shall be required to retain for a minimum of 5 years any records of monitoring activities and results (whether or not such monitoring activities are required by this permit and shall make such record available for inspection and copying by the Authority and NJDEP. This period of retention shall be extended during the course of any unresolved litigation regarding the permittee or when requested by the Authority or NJDEP.

14) Permittee shall notify the Authority immediately of all discharges that could cause problems to the Authority's treatment works including any slug loadings. A slug loading is any discharge of a non-routine episodic nature including, but not limited to an accidental spill or a non-customary batch discharge.

A notice shall be permanently posted on the bulletin board or other prominent place advising all employees of the responsible person to call in the event of an accidental or non-compliance discharge. This person shall be responsible for initiating emergency notification procedures in accordance with this paragraph and paragraph 19. Permittees shall insure that all employees, who could cause such an accidental or non-compliance discharge to occur, are advised of the emergency notification procedure.

15) The permittee shall notify the Authority, the USEPA Regional Waste Management Division Director, and NJDEP in writing of any discharge into the Authority's Treatment Works, Intercepting Sewer or Local Sewer of a substance, which, if otherwise disposed of, would be a hazardous waste under 40 CFR Part 261. Such notification must include the name of the hazardous waste as set forth in 40 CFR Part 261, the USEPA hazardous waste number, and the type of discharge (continuous, batch, or other). If the permittee discharges more than 100 kilograms of such waste per calendar month to the Authority's Treatment Works, Intercepting Sewer or Local Sewers, the notification shall also contain the following information to the extent such information is known and readily available to the permittee: An identification of the hazardous constituents contained in the wastes, an estimation of the mass and concentration of such constituents in the wastestream discharged during that calendar month, and an estimation of the mass of constituents in the wastestream expected to be discharged during the following twelve months. All notifications for existing sources must take place within 180 days after the discharge of the listed or characteristic hazardous waste. Any notification under this paragraph need be submitted only once for each hazardous waste discharged. However, notifications of changed discharges must be submitted in accordance with Paragraph 19)E. The notification requirement in this section does not apply to pollutants already reported under the self-monitoring requirements of Section 3.

(Cont.)

16) Dischargers are exempt from the requirements of paragraph 15 during a calendar month in which they discharge no more than fifteen kilograms of hazardous wastes, unless the wastes are acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e). Discharge of more than fifteen kilograms of non-acute hazardous wastes in a calendar month, or of any quantity of acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e) requires a one-time notification.
Subsequent months during which the Industrial User discharges more than such quantities of any hazardous waste do not require additional notification.

17) In the case of any new regulations under section 3001 of RCRA identifying additional characteristics of hazardous waste or listing any additional substance as a hazardous waste, the Industrial User must notify the Authority, the EPA Regional Waste Management Waste Division Director, and NJDEP of the discharge of such substance within ninety (90) days of the effective date of such regulations.

18) In the case of any notification made under paragraph 15, the Industrial User shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical.

19) Permittee shall provide additional self monitoring reports as follows:

A. Report any exceedance of an effluent limitation that causes injury to persons, or damage to the environment, or poses a threat to human health or the environment, within two (2) hours of its occurrence, or of the permittee becoming aware of its occurrence.

B. Within twenty-four (24) hours of an event described in A. above, or of an exceedance, or of becoming aware of an exceedance, of an effluent limitation for a toxic pollutant, a permittee shall provide such additional information on the discharge as may be required by the Authority, including an estimate of the danger posed by the discharge to the environment, whether the discharge is continuing and the measures taken, or being taken, to remediate the problem and any damage to the environment, and to avoid a repetition of the problem.

C. A permittee shall be required to file monthly reports if the permittee:

(1) in any month commits a serious Violation or fails to submit a completed discharge monitoring report and such failure to report continues unabated following thirty (30) days notice from the Authority; or
(2) exceeds an effluent limitation for the same pollutant at the same discharge point source by any amount for four (4) out of six (6) consecutive months (in the case of a permittee who files monthly reports); or for one report (in the case of a permittee who files reports at quarterly, bi-yearly or yearly intervals).

(Cont.)

The monthly reporting requirement shall apply to those constituents which triggered the violations noted in Paragraph 19 (1) and (2) above. The reporting requirements stipulated in the permit shall be restored if the permittee has not committed any of the violations identified in Paragraph 19 (C) (1) and (2) above for six (6) consecutive months. The term "Serious Violation" shall be as defined in Article II of the Authority's Rules and Regulations.

D. A permittee shall report to the Authority any Serious Violation within thirty (30) days of the violation, together with a statement explaining the nature of the serious violation and the measures taken to remedy the cause or prevent a recurrence of the serious violation.

E. A permittee shall notify the Authority in advance of the quality and quantity of all new introduction of pollutants into the Authority's Treatment Works or a local sewer system and of any substantial change in the pollutants introduced into a facility by an existing user of the facility. The notification shall estimate the effects of the changes on the effluents to be discharged into the facility.

20) The Authority shall have the right of entry to all premises in which a discharge source is or might be located or in which monitoring equipment or records required by a permit are kept, for purposes of inspection, sampling, copying or photographing.

21) The Authority shall have the right to perform an inspection and sample the effluent of a permittee at such times and at such frequencies as the Authority deems necessary to confirm compliance with pretreatment requirements.

22) Wastewater discharge permits may be transferred to a new owner or operator only if permittee gives at least thirty (30) days advance notice to Industrial Pretreatment Coordinator and Industrial Pretreatment Coordinator approves the wastewater discharge permit transfer. The notice to Industrial Pretreatment Coordinator must include a written certification by the new owner or operator which:

A) States that the new owner and/or operator has no immediate intent to change the facility's operations and processes;

B) Identifies the specific date on which the transfer is to occur; and

C) Acknowledges full responsibility for complying with the existing wastewater discharge permit.

23) All Industrial Wastewater permits issued to a particular user are void upon the issuance of a new Industrial Wastewater Permit to that user.

Local Pretreatment Limits

Hazardous limits:

Parameter	Limitation (mg/l)
Acrolein	0.30
Acrylonitrile	8.40
Benzene	0.85
Bromoform	1.00
Carbon Tetrachloride	0.15
Chlorobenzene	10.60
Chloroethane	21.50
Chloroform	1.75
1,2-Dichlorobenzene	21.60
1,4-Dichlorobenzene	26.30
1,1-Dichloroethane	19.40
1,2-Dichloroethane	4.50
1,1-Dichloroethylene	0.14
1,2-Trans Dichloroethylene	17.00
1,2-Dichloropropane	21.20
Ethyl Benzene	9.30
Methylene Chloride	17.00
1,1,2,2-Tetrachloroethane	3.85
Tetrachloroethylene	1.80
Toluene	8.10
1,1,1-Trichloroethane	65.00
1,1,2-Trichloroethane	8.60
Trichloroethylene	3.30
Trichlorofluoromethane	6.25
Vinyl Chloride	0.00024*

*Limit to be set at current detection limit of 0.002 mg/l.

Copper (T)	1.0 mg/l Daily Maximum
Cyanide	** 0.50 mg/l Daily Maximum
Oil or Grease Petroleum origin	100 mg/l Monthly Average 150 mg/l Single Sample
Explosivity	5% LEL any 2 successive Readings 10% LEL any 1 reading

Non-hazardous limits:

Biochemical Oxygen Demand, BOD	BCUA must be notified if over 350 mg/l
Suspended Solids, S.S.	BCUA must be notified if over 350 mg/l
pH	5.5 - 9.5 Daily Range
Oil or Grease Non-petroleum origin	200 mg/l Daily Maximum

Note:
(T) = Total
** = Categorical limit replaced by a more stringent local limit.

Section 3 - Monitoring Schedule

The company being Ganes Chemicals, shall monitor its effluent wastestream per the following schedule. All sampling and analysis shall be performed in accordance with 40 CFR Part 136 or the approved equivalent method.

Samples taken in compliance with the specified monitoring requirements shall be taken at the following location: **Discharge Point on Garden Street.**

Monthly Monitoring

Parameter	Sample Type	Sample Frequency	Monitoring Frequency
pH	Continuous	Continuous	Continuous
Biochemical Oxygen Demand	Composite	24 Hours	One Day per Month
Suspended Solids	Composite	24 Hours	One Day per Month
Oil and Grease Total	Grab	1 per 24 Hours	One Day per Month
Oil and Grease Petroleum Hydorcarbons	Grab	1 per 24 Hours	One Day per Month
Total Volatile Organics (Method 624)	Grab	1 per 24 Hours	One Day per Month
*Cyanide (T)	Grab	1 per 24 Hours	One Day per Month

Note:
(T) = Total

* In lieu of monitoring for cyanide you may certify to the Authority in writing that you do not use nor generate this compound, in accordance with 40 CFR Part 439.36 (a) (2).

Section 4 - Monitoring Requirements

Not later than fourteen (14) days following each month in the Monitoring Schedule the industrial user shall submit to Bergen County Utilities Authority a compliance report consisting at minimum of the following items:

1) Any change in company name, ownership, contact person or authorized representative changed;

2) Average and maximum daily regulated wastewater flow, with an explanation of how obtained (flow meter, volume displacement, water bills, etc.);

3) An accounting of each pollutant required by Section 3 - Monitoring Schedule either by analysis or by statement of non-use. In addition, if any pollutant is monitored more frequently than required by Section 3 - Monitoring Schedule, the results of this monitoring shall also be included;

4) Chain of custody identifying the duration of composite samples (start and finish) and sampling time for grab samples;

5) The name, address and identification number of the NJDEP certified laboratory that performed the analysis;

6) A statement of compliance or a compliance schedule in the event of non-compliance; and,

7) A certification from an authorized representative of the permittee which states:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

BY: ______________________ ____________________________."

Signature Name and Title (typed)

Section 5 - Statement of Penalties

The Authority may take any and all actions and pursue any and all remedies permitted by federal law and the laws of the State of New Jersey to enforce the provisions of the "Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works".

These actions and remedies shall include, but not necessarily be limited to those set forth in Article VI of the "Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Works". Wherever in Article VI reference is made by title to any official or employee of the Authority, it shall be understood that such official or employee shall act as the duly appointed representative of the Executive Director. The Executive Director shall at all times have the right to undertake any action delegated to such official or employee or authorize other authority officials or employees to undertake such delegated duties as well.

Enforcement Actions available to the Authority include, but are not necessarily limited to, the following:

(A) Issue an order to comply in accordance with the provisions of Section 10 of P.L. 1977, c.74 (N.J.S. 58:10A-10);

(B) Bring a civil action in accordance with the provisions of Section 10 of P.L. 1977, c.74 (N.J.S. 58:10A-10);

(C) Issue a summons in accordance with the provisions of Section 1 of P.L. 1991, c.8 (N.J.S. 58:10A-10.4);

(D) Issue a civil administrative penalty in accordance with the provisions of Section 2 of P.L. 1991, c.8 (N.J.S. 58:10A-10.5);

(E) Bring an action for a civil penalty in accordance with the provisions of Section 10 of P.L. 1977, c.74 (N.J.S. 58:10A-10);

(F) Petition for the commencement of a criminal action in accordance with the provisions of Section 10 of P.L. 1977, c.74(N.J.S. 58:10A-10);

(G) Seek injunctive relief against a violation or threatened violation in accordance with the provisions of Section 7 of P.L. 1972, c.42, as amended by Section 18 of P.L. 1990,c.28(N.J.S.58:11-55); and

(H) Seal or close off sewerage connections in accordance with the provisions of Section 8 of P.L. 1972,c.42(N.J.S.58:11-56).

In the event of a violation of any rule, regulation or pretreatment standard adopted by the Authority, the Authority shall take one of the enforcement actions set forth above or obtain injunctive relief against the violation. If applicable, the Authority shall assess civil administrative penalties in amounts no less than the minimums set forth in P.L. 1990, c.28, section 6 (N.J.S. 58:10-10.1). Nothing contained in this section shall be construed to prohibit or otherwise limit the Authority from pursuing any other remedy permitted by federal law and the laws of the State of New Jersey.

FACT SHEET

INDUSTRIAL WASTEWATER DISCHARGE PERMIT TO DISCHARGE TO THE BERGEN COUNTY UTILITIES AUTHORITY TREATMENT WORKS

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Ganes Chemicals
611 Broad Street
Carlstadt, New Jersey 07072

TYPE OF PERMIT: Categorical Industry Regulated by 40 CFR 439.36, Pharmaceutical Pretreatment Standards for Existing Sources, Subpart C - Chemical Synthesis Products Subcategory

SIC CODES: 2833

FLOW CATEGORY: > 25,000 gpd

AVERAGE DAILY FLOW RATE: 37,500 gpd

DESCRIPTION OF FACILITY OPERATIONS:

Ganes Chemicals is a manufacturer of active pharmaceutical ingredients and intermediates.

PRETREATMENT: pH Neutralization

DESCRIPTION OF SAMPLING POINT: Collection pit on Garden Street. The combined wastestream formula was not utilized for this facility, the more stringent local limit replaces the categorical limit for cyanide.

SAMPLING PARAMETERS:

Cyanide, pH, Biochemical Oxygen Demand, Suspended Solids, Oil and Grease (Total), Oil and Grease (Petroleum Hydrocarbons), Total Volatile Organics.

Cyanide must be monitored in accordance with the Pharmaceutical Standards. In lieu of monitoring for cyanide the permittee may certify non use. The remaining pollutants were selected for self-monitoring because historical data reveals that they have the potential to be in the discharge.

STATEMENT OF BASIS:

Categorical limits are in accordance with 40 CFR 439.36, Pharmaceutical Pretreatment Standards for Existing Sources, Subpart C - Chemical Synthesis Subcategory. Cyanide has categorical limits replaced by a more stringent local limit. In addition, Section 1 - General Conditions and Section 2 - Discharge Limitations of the Industrial Wastewater Discharge Permit are in accordance with the General Pretreatment Regulations, 40 CFR 403.6 and the Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Work, adopted October 1994.

Wastewater Discharge Permit

Permit Information:

- Permit #: 98-0287
- Description: Permit to discharge industrial wastewater to sanitary sewer
- Agency: Bergen County Utilities Authority (BCUA)
- Duration: 1 Year

Current Permit:

- Effective: March 1, 1998
- Expires: February 28, 1999
- Renewal: Automatically renewal following comment period on draft permit.
- Inspections: Periodic announced and unannounced inspections and sample collection
- Sampling: Samples are collected and analyzed for the following once per month:
  - Biochemical Oxygen Demand – 24 hour composite
  - Total suspended Solids – 24 hour composite
  - Oil & Grease - grab
  - Total Petroleum Hydrocarbons - grab
  - Total Volatile Organics - grab
  - Total Cyanide - grab
- Monitoring: The following parameters are monitored continuously:
  - Flow
  - pH
- Reporting: Self Monitoring Report, sample results, and pH recording charts submitted to BCUA once per month.

Local Pretreatment Limits

Hazardous limits:

Parameter	Limitation (mg/l)
Acrolein	0.30
Acrylonitrile	8.40
Benzene	0.85
Bromoform	1.00
Carbon Tetrachloride	0.15
Chlorobenzene	10.60
Chloroethane	21.50
Chloroform	1.75
1,2-Dichlorobenzene	21.60
1,4-Dichlorobenzene	26.30
1,1-Dichloroethane	19.40
1,2-Dichloroethane	4.50
1,1-Dichloroethylene	0.14
1,2-Trans Dichloroethylene	17.00
1,2-Dichloropropane	21.20
Ethyl Benzene	9.30
Methylene Chloride	17.00
1,1,2,2-Tetrachloroethane	3.85
Toluene	8.10
1,1,1-Trichloroethane	65.00
1,1,2-Trichloroethane	8.60
Trichloroethylene	3.30
Trichlorofluoromethane	6.25
Vinyl Chloride	0.00024*

*Limit to be set at current detection limit of 0.002 mg/l.

Copper (T)	1.0 mg/l Daily Maximum
Cyanide	0.50 mg/l Daily Maximum
Oil or Grease Petroleum origin	100 mg/l Monthly Average 150 mg/l Single Sample
Explosivity	5% LEL any 2 successive Readings 10% LEL any 1 reading

Non-hazardous limits:

Biochemical Oxygen Demand, BOD	BCUA must be notified if over 350 mg/l
Suspended Solids, S.S.	BCUA must be notified if over 350 mg/l
pH	5.5 - 9.5 Daily Range
Oil or Grease Non-petroleum origin	200 mg/l Daily Maximum

Note:
(T) = Total

FACT SHEET

FOR THE INDUSTRIAL WASTEWATER DISCHARGE PERMIT TO DISCHARGE WASTEWATER TO THE BERGEN COUNTY UTILITIES AUTHORITY TREATMENT WORKS

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Ganes Chemicals
611 Broad Street
Carlstadt, New Jersey 07072

TYPE OF PERMIT: Categorical Industry Regulated by 40 CFR 439.46, Pharmaceutical Pretreatment Standards for Existing Sources

SIC CODES: 2833

FLOW CATEGORY: > 25,000 gpd

AVERAGE DAILY FLOW RATE: 152,000 gpd

DESCRIPTION OF FACILITY OPERATIONS:

Ganes Chemicals manufactures bulk medicinal chemicals by dry and liquid blending and mixing.

PRETREATMENT: pH Neutralization, Cyanide Destruction, Ammonia Treatment

DESCRIPTION OF SAMPLING POINT: Collection pit on Garden Street. The combined wastestream formula was not utilized for this facility, the more stringent local limit replaces the categorical limit for cyanide.

SAMPLING PARAMETERS:

Cyanide, pH, Biochemical Oxygen Demand, Suspended Solids, Oil and Grease (Total), Oil and Grease (Petroleum Hydrocarbons), Total Volatile Organics.

STATEMENT OF BASIS:

Categorical limits are in accordance with 40 CFR 439.46, Pharmaceutical Pretreatment Standards for Existing Sources. Cyanide has categorical limits replaced by a more stringent local limit. In addition, General Conditions are in accordance with the General Pretreatment Regulations, 40 CFR 403.6. The permittee is also subject to the local limits incorporated in the <u>Rules and Regulations for the Direct and Indirect Discharge of Wastewater to the Bergen County Utilities Authority Treatment Work</u>, adopted October 1994.

Notice of Authorization

Permit No.:	Issuance Date:	Effective Date:	Expiration Date:
98-0287	3/1/98	3/1/98	2/28/99

Issued to:	For Activity/Facility at:	Owner:	Type of Business:
Ganes Chemicals	611 Broad Street Carlstadt, N.J. 07072	611 Broad Street Carlstadt, N.J. 07072	Pharmaceuticals

Issued By:	Type of Permit:
Compliance Department	Categorical 40 CFR Part 439.36 Subpart C

A Permit To:
Discharge process wastewater from pharmaceutical manufacturing into the Bergen County Utilities Authority Little Ferry Treatment Plant, via the Borough of Carlstadt sanitary sewer collection system, in accordance with wastewater discharge limitations, monitoring requirements, and other requirements set forth in the permit on file at the facility.

Christine LaRocca

BCUA Authorization
Christine LaRocca, IPP Coordinator

BCUA Spill Emergency or Non-Compliance Notification
Hotline (201) 641-2552 (24 hrs. a day, 7 days per week.)

BERGEN COUNTY UTILITIES AUTHORITY

THIS NOTICE MUST BE CONSPICUOUSLY DISPLAYED AT THE ACTIVITY/FACILITY SITE.

Physical Connection Permit

Permit Information:

- Permit #: 0900
- Description: Permit to ensure proper installation and operation of three Backflow Prevention Devices (1 in the basement of the R&D building and two in Room 8)
- Agency: New Jersey Department of Environmental Protection
  Water Supply Element
- Permit Duration: 1 Year

Current Permit:

- Permit Effective: April 1, 1998
- Permit Expires: March 31, 1999
- Permit Renewal: Awaiting annual fee and renewal notice
- Inspections: Quarterly testing of backflow prevention devices by certified tester
- Reporting: Annual submission of quarterly Test and Maintenance Report Forms with the Permit Renewal Application Form.

Let's protect our earth

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER SUPPLY ELEMENT
BUREAU OF SAFE DRINKING WATER
CN 426, Trenton, N.J. 08625-0426

PERMIT*

The New Jersey Department of Environmental Protection and Energy grants this permit in accordance with your application, attachments accompanying same application and applicable laws and regulations. This permit is also subject to the further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit.

Permit No.	Issuance Date	Effective Date	Expiration Date
0900	March 27, 1992	April 1, 1998	March 31, 1999

Name and Address of Applicant	Location of Activity/Facility	
Ganes Chemicals, Incorporated 630 Broad Street Carlstadt, N.J. 07072	Carlstadt Borough 611-641 Broad St. & 418 Orchard St.	
	Type of Permit	**Statute(s)**
	RENEWAL PHYSICAL CONNECTION PERMIT	N.J.A.C. 7:10-10.1 et seq.

This permit grants permission to: Maintain, own and operate a Physical Connection between an approved Public Community Water System and an Unapproved Water Supply at the above named location, in consideration of the renewal permit application received, May 27, 1998.

Number, Type and size of Backflow Preventor Valves Permitted - Two 2 inch & one 3 inch RPZs

Owner of Approved Public Water System - United Water New Jersey
Local Administrative Authority - Mid-Bergen Reg Hlth Comm
Source of Unapproved Water Supply - Private Well

This Permit is subject to the Following Specific Conditions:

1. The above listed valves, shall be tested for tightness, under prevailing pressure conditions at least once every three months. NJAC 7:10-10.6(a)1.

2. The above listed valves, shall be disassembled and internally inspected for integrity of the internal machanism, within six months prior to the for submission of an application for permit renewal. NJAC 7:10-10.6(a)2. *A Reduced Pressure Zone (RPZ) valve shall not be subject to the internal inspection except as provided in NJAC 7:10-10.6(a)4.*

3. The owner of the facility where the physical connection exists shall either arrange for witnessing of these tests and annual internal inspection with a represenaitve of the supplier of water and/or the local administrative authority, or shall use a certified tester who holds a valid backflow prevention device testers certificate issued by a certifying agency approved by the Department, as per NJAC 7:10-10.8(f).

4. Upon completion of each test and inspection, the permit holder shall have the results and certifications of those present recorded on the Quarterly Test and Maintenance Report Form. And prior to expiration of this permit complete the Physical Connection Permit Renewal Application Form and submit it to the Department with all the Quarterly Test and Maintenance Report forms from the preceding permit year as per NJAC 7:10-10.5(b).

cc: United Water New Jersey
Mid-Bergen Reg Hlth Comm

Approved by the authority of:

Water Supply Element

Barker Hamill, Bureau Chief

* The word permit means "approval, certification, registration"

(GENERAL CONDITIONS ARE ON THE REVERSE SIDE)

NJPDES DISCHARGE PERMIT

RECEIVED JUL 1 0 1995

State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection
Bureau of Stormwater Permitting
Office of Land and Water Planning
CN-029
Trenton, NJ 08625-0029

Robert C. Shinn, Jr.
Commissioner

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

DATE: JUL 6 - 1995

GANES CHEMICALS INC
611-640 BROAD ST
CARLSTADT, NJ 07072

Re: GANES CHEMICALS INC
NJPDES Permit No. NJ0104591
Final Permit Issuance

Dear Applicant:

Enclosed is the final New Jersey Pollutant Discharge Elimination System (NJPDES) discharge to surface water (DSW) permit issued in accordance with the NJPDES regulations (N.J.A.C. 7:14A-1 et seq).

Comments on the draft permit were not received from the applicant.

Several changes were made to the final permit. These changes were for clarification purposes only. No significant changes were made to the contents of the permit. These changes are outlined on the attached notice.

The permittee, or any interested party under the N.J.A.C. 7:14A-8.9(a), may submit a written request for an adjudicatory hearing within 30 calendar days of receipt of this final NJPDES permit to contest the conditions of the permit. Any reasonably ascertainable issues must have been raised during the public comment period, pursuant to N.J.A.C. 7:14A-8.4. The requirements for requesting an adjudicatory hearing can be found at N.J.A.C. 7:14A-8.9. The enclosed Administrative Hearing Request Checklist and Tracking Form for Permits must be completed and a copy of the completed form, along with the information required in Part III of that form, including attachments, must be submitted to each party listed on the form. If a STAY of contested conditions is requested under N.J.A.C. 7:14A-8.10, a copy of the STAY request and supporting documentation shall be sent to the parties listed on the Administrative Hearing Request Checklist and Tracking Form for Permits and to John Covino, DAG, Asst. Section Chief, Environmental Permitting and Counseling Section, Division of Law, Hughes Justice Complex, CN-93, Trenton, NJ 08625.

An application for renewal of this NJPDES permit must be submitted at least 180 days prior to expiration of the permit in accordance with N.J.A.C. 7:14A-2.1(g)5.

Should you have any questions concerning this action, please contact the bureau at (609) 633-7021.

Sincerely,

Ed Frankel for B C.

Barry Chalofsky, Manager
Bureau of Stormwater Permitting

Enclosure: Final Permit

cc: Final Permit Distribution List

New Jersey Pollutant Discharge Elimination System/ Stormwater Discharge Permit

The New Jersey Department of Environmental Protection hereby restricts and controls the discharge of pollutants to waters of the State from the subject facility/activity in accordance with applicable laws and regulations. The permittee is responsible for complying with all terms and conditions of this authorization and agrees to said terms and conditions as a requirement for the construction, installation, modification or operation of any facility for the collection, treatment or discharge of any pollutant to waters of the State.

PERMIT NUMBER NJ0104591

FINAL

Permittee	Co-Permittee
GANES CHEMICALS INC 611-640 BROAD ST CARLSTADT, NJ 07072	

Property Owner	Location of Activity
GANES CHEMICALS INC 611-640 BROAD ST CARLSTADT, NJ 07072	GANES CHEMICALS INC 611-640 BROAD ST CARLSTADT, NJ 07072

Type of Permit Covered By This Approval	Issuance Date	Effective Date	Expiration Date
RF: Stormwater Runoff	7-1-95	7-1-95	6-30-98

DISCHARGED TO:
PASSAIC RIVER

CLASSIFICATION:
FW2-NT/SE2

By Authority of:
COMMISSIONER'S OFFICE

Ed Frankel for BC

DEP AUTHORIZATION
Barry Chalofsky, P.P.
Manager
Bureau of Stormwater Permitting

(Terms, conditions and provisions attached hereto)
State of New Jersey Department of Environmental Protection

NOTICE OF CHANGES TO FINAL PERMIT

1. Page 2, Table 1, under Non-Numeric Limitations the word "SPPP" has been removed for the parameters chemical oxygen demand, total petroleum hydrocarbons, and total suspended solids. Under the same column the word "Part 1 Report" has been removed from the parameter Stormwater Discharge Associated with Industrial Activity.

2. Page 2, under Table 1, Footnote (4) has been revised to clarify the use of NJDEP Field Sampling Procedures Manual.

3. Page 2, Table 2, under "Deadline" column and "Implement SPPP" row, the footnote on "18 months after EDP(3)" has been changed from (3) to (4).

4. Page 2, Table 2, under "Certification Required" column and "Develop SPPP" row, the note to submit the SPPP to Central File and Enforcement has been added.

5. Page 2, Table 2, under "Certification Required" column and "Part 1 Report" row the words "and Certification" have been removed to reflect the change that a certification for Part 1 Report in no longer required.

6. Page 3, Part I., A., 1.a., first paragraph, second to last sentence, the words "according to Attachment 1, VII.C." have been moved to the end of the last sentence for clarification purposes.

7. Page 5, Part I., A., 7., first paragraph, second sentence, has been changed to reflect the change that the laboratory analytical results no longer have to be submitted with the DMRs.

8. Page 6, Part I., A., 7., second paragraph, last sentence, has been changed to clarify the use of NJDEP Field Sampling Procedures Manual.

9. Attachment 1, VII., B., 3., has been changed to reflect the change from an annual submission of SPPP updates to a submission requirement of only when revision are made to the SPPP.

TABLE 1
NON-NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS[1]

Parameter[2]	Non-Numeric Limitations[3]	Monitoring Requirements[4] Frequency	Type
Chemical Oxygen Demand	Part 1 Report	Semi-Annual[5]	Multi-Grab[6]
Total Petroleum Hydrocarbons	Part 1 Report	Semi-Annual	Multi-Grab
Total Suspended Solids	Part 1 Report	Semi-Annual	Multi-Grab
Lead	Part 1 Report	Semi-Annual	Multi-Grab
Copper	Part 1 Report	Semi-Annual	Multi-Grab
Nickel	Part 1 Report	Semi-Annual	Multi-Grab
Stormwater Discharges Associated with Industrial Activity	SPPP	Annual	Inspection

(1) Monitoring locations and Discharge Serial Numbers (DSN) will be identified in the approved Monitoring Plan required in the Part 1 Report.
(2) Sample parameters shall be analyzed in accordance with 40CFR Part 136 methods, or other USEPA approved methods as applicable.
(3) Non-numeric limitations may change in the replacement permit to include Part 1 Report BMPs.
(4) Refer to Part I.A.7. ***"NJDEPE Field Sampling Procedures Manual"*** shall be utilized as guidance for sample collection. The conditions in this permit shall take precedent over these guidelines.
(5) Commencing 12 months after the effective date of the permit (EDP) until permit termination or revocation. Monitoring results shall be reported semi-annually.
(6) Multiple grab samples <u>need not</u> exceed 3 samples total and shall be collected as follows: the first grab sample shall be collected within 30 minutes (or as soon thereafter as practicable) after stormwater discharge begins (ASWD), the second grab between 30 and 45 minutes ASWD (or as soon thereafter as practicable), and the third grab sample between 45 and 60 minutes (or as soon thereafter as practicable) ASWD. For sampling procedures, follow guidelines in ***"NJDEPE Field Sampling Procedures Manual"***, latest edition.

TABLE 2-DEADLINES AND CERTIFICATIONS

Activity	Deadline	Certification Required[1]
Develop SPPP (see Attachment 1)	6 months after EDP[2] (submit SPPP to Enforcement Field Office and Department Central File Room)	SPPP Preparation Certification (Attachment 2)
Part 1 Report	9 months after EDP	Part 1 Report
Semi-Annual Discharge Monitoring	Beginning 12 months after EDP	Semi-Annual Discharge Monitoring Reports[3]
Implement SPPP	18 months after EDP [4]	SPPP Implementation and Inspection Certification. (Attachment 3)
Inspections	Annual after 18 months of EDP	SPPP Implementation and Inspection Certification, Recertification. (Attachment 3)

(1) To be submitted to the Bureau of Stormwater Permitting
(2) EDP: Effective date of permit
(3) Refer to Part II.B.3., pg. 8 for reporting requirements.
(4) Except for those BMPs (e.g., spill response, good housekeeping) that can be readily implemented in 30 days, in accordance with Attachment 1, VI.

The monitoring plan will be evaluated for approval within 3 months from the date of receipt by the Bureau of Stormwater Permitting. The Department will notify the permittee that the monitoring plan has been approved and will mail Discharge Montoring Reports (DMRs) for reporting sampling results. All sampling data shall be reported on DMRs in accordance with Part II.B.3. of this permit.

2. Soil Erosion and Sediment Control Plan

For stormwater discharges from construction activities disturbing less than five acres of total land area which are not part of a larger common plan of development or sale, the SPPP shall include proof that any certification or municipal approval required under the Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-39 et seq.) has been obtained.

Stormwater discharges from construction activities disturbing five acres or more of total land area, or less than five acres which are part of a five acre or greater plan of development or sale, must be authorized either by modification to this permit or separately under NJPDES Permit No. NJ0088323 (General Stormwater Permit Construction Activity). The permittee shall contact the Bureau of Stormwater Permitting to obtain Department approval prior to engaging in such construction activities or requesting authorization under NJPDES Permit No. NJ0088323.

3. Operation and Maintenance

The permittee shall be responsible for supervising and managing the operation and maintenance of this facility and any BMPs which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements identified in the stormwater pollution prevention plan. Proper operation and maintenance also requires the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit.

4. Inspections

Once the SPPP has been implemented (18 months after EDP) in accordance with this permit and Attachment 1,V.G., the permittee shall conduct both routine and annual inspections of the facility. Routine inspections shall be conducted by facility personnel for designated areas, operations, and equipment.

Annual inspections of the entire facility shall also be conducted to identify areas contributing to the stormwater discharge(s) authorized by this permit and to evaluate whether the SPPP complies with this permit, and is being properly implemented, or whether additional measures are needed to meet the conditions of this permit. A summary of each inspection shall be included in the SPPP as required under Attachment 1, V.G.

for sample collection. The conditions in this permit shall take precedent over these guidelines.

The criteria for a valid storm event, during which a grab sample shall be collected, is any storm event that produces a stormwater discharge during working hours (7:30 AM through 5:00 PM) Monday through Friday and which has not been preceded by another storm event within the last 72 hours. The permittee shall record and submit with the DMRs for each sampling event the following storm event information: (1) date and approximate time the storm event began; (2) inches of rainfall or snowfall; (3) storm event duration in hours and/or minutes, as appropriate; (4) number of hours since last storm event which caused a stormwater discharge; and (5) date and time that each grab sample was collected.

Part II. General Requirements

A. Regulatory Duties

1. Duty to Comply

The permittee shall comply with all conditions of this permit and the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules (N.J.A.C. 7:14A). Any permit noncompliance constitutes a violation of the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq., hereinafter referred to as the State Act) or other authority of the NJPDES Rules (N.J.A.C. 7:14A) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application (N.J.A.C. 7:14A-2.5(a)1). The following sections of the NJPDES Rules are applicable to discharge to surface water permits (DSW) and should be referred to by the permittee:

7:14A-1.8	Fee Schedule for NJPDES Permittees and Applicants
7:14A-1.9	Definitions
7:14A-2.3	Continuation of expired permits
7:14A-2.4	Signatories
7:14A-2.5	Requirements applicable to all permitees
7:14A-2.8	Schedules of compliance
7:14A-2.9	Requirements for recording and reporting of monitoring results
7:14A-2.10	Effect of a permit
7:14A-2.11	Transfer of permits
7:14A-3.10	Additional conditions concerning reporting requirements applicable to all DSW permits
7:14A-3.11	Additional conditions applicable to specified categories of DSW permits

B. Reporting Requirements

1. Reporting Changes and Violations

a. Planned Changes

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could change the nature or increase the quantity of the pollutants discharged (N.J.A.C. 7:14A-2.5(a)14i).

b. Anticipated Noncompliance

The permittee shall give reasonable advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with the permit requirements (N.J.A.C. 7:14A-2.5(a)14ii).

2. Reporting Noncompliance

The permittee shall report to the Department any noncompliance including, but not limited to, violations of effluent limitations that cause, or have the potential to cause, injury to persons or to the environment or poses a threat to human health or the environment. Reporting shall be as stipulated in N.J.A.C. 7:14A-2.5(a)14vi and N.J.A.C. 7:14A-3.10(a).

3. Reporting Monitoring Results

a. Monitoring results shall be summarized and reported on the appropriate DMRs following the completed reporting period. Unless otherwise specified or directed, signed copies of these shall be submitted postmarked no later than the 25th day of the month following the completed reporting period to the following address:

NJDEP
Bureau of Permits Management
CN 029
Trenton, New Jersey 08625
Attn: Monitoring Reports

b. If a contract laboratory is utilized for analyses, the permittee shall submit the name and address of the laboratory and the parameters analyzed at the time it submits its monitoring reports as required by N.J.A.C. 7:14A-2.5(a)12iv. Any change in the contract laboratory being used or the parameters analyzed shall be reported prior to or together with the monitoring report covering the period during which the change was made.

c. All permit applications and associated information, and all monitoring data shall be available for public inspection at the Department offices. All other submittals shall likewise

3. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of the provisions of this permit shall not be affected thereby (N.J.A.C. 7:14A-1.5).

4. Violations under Section 10 of the State Act

a. Any person who violates the State Act, including but not limited to a violation of this permit or the NJPDES rules, is subject to a civil penalty for each violation, with each day of violations constituting a separate and distinct offense.

b. Any person who purposely, knowingly, recklessly, or negligently violates the State Act, including making a false statement, representation, or certification in any application, record, or other document filed or required to maintained under the State Act, or by falsifying, tampering with, or rendering inaccurate any monitoring device or method required to be maintained under the State Act, or by failing to submit a monitoring report (or any portion thereof) required pursuant to the State Act, shall upon conviction, be subject to a fine for each violation, or by imprisonment, or both.

5. Violation of any condition of this permit or the NJPDES Rules may subject the permittee to an Assessment of Civil Administrative Penalties of up to $50,000 per violation per day in accordance with N.J.A.C. 7:14-8.

6. Inspection and Entry

a. The permittee shall allow the Regional Administrator of the United States Environmental Protection Agency (USEPA), the Department or any authorized representative(s), upon the presentation of credentials and other documents as may be required by law, to inspect the permittee's premises in accordance with N.J.A.C. 7:14A-2.5(a)11 et seq.

b. Any refusal by the permittee, facility land owner(s), facility lessee(s), their agents, or any other person(s) with legal authority, to allow the authorized representatives of the Department and/or USEPA shall constitute grounds for suspension, revocation and/or termination of this permit, or other permit or enforcement action pursuant to N.J.A.C. 7:14-8.7.

c. By acceptance of this permit, the permittee consents to any inspections by authorized representatives of the Department and/or USEPA to determine the extent of compliance with any and all conditions of this permit and agrees not to, in any manner, seek to charge said representatives with a civil or criminal act of trespass when they enter the premises occupied by the permittee for said inspection purposes.

Part III. Special Conditions

"Source materials" means any materials or machinery, located at the facility and directly or indirectly related to process or other industrial activities, which could be a source of pollutants in a stormwater discharge associated with industrial activity that is subject to N.J.A.C. 7:14A-3.8. Source materials include, but are not limited to: raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels; and lubricants, solvents, and detergents that are related to process or other industrial activities. Material or machinery that are not exposed to stormwater or that are not located at the facility are not "source materials".

"Stormwater" means stormwater runoff, snow melt runoff, and surface runoff and drainage.

"Stormwater discharge" means a stormwater discharge to surface waters of the State.

Table of Contents

A. Inventory Requirements

Each facility must develop and update annually, as appropriate, an inventory which includes, at a minimum, the following:

1. list of the general categories of source materials that have been used, loaded/unloaded, stored, treated, spilled, leaked and/or disposed onsite in a manner to allow exposure to stormwater; and

2. list of any domestic wastewater, non-contact cooling water, or process waste water (see definitions in Part IV of permit), that is generated at the facility and discharged through separate storm sewers (see definition section of Part IV of permit) to surface waters. List any current NJPDES (New Jersey Pollutant Discharge Elimination System) permits or permit application that the facility may have for such discharges.

B. Mapping Requirements

A site map drawn to an appropriate scale that clearly shows the following:

1. buildings and other permanent structures;

2. paved areas and roadways;

3. surface water bodies (e.g., rivers, lakes, streams, bays, estuaries) that are located on or abut the property which receive or may receive stormwater from the site;

4. location of all stormwater discharge points and outfalls;

5. location of each point or sewer segment, where domestic waste water, process waste water, or non-contact cooling water generated by the facility enters storm sewers that discharge to surface waters;

6. outline of the drainage area within the facility boundaries for each stormwater outfall and a depiction of flow direction (e.g., arrow head) of stormwater in each drainage area;

7. locations where source materials are likely to be exposed to stormwater, and the following activities and/or areas, at a minimum; storage areas, palleted materials, outdoor handling, treatment or disposal areas, loading and/or unloading areas, manufacturing and/or processing areas, waste storage areas, vehicle/equipment maintenance areas, vehicle/equipment fueling areas, hazardous waste storage or disposal areas, areas of spills and/or leaks of source materials, and access routes;

8. location of existing stormwater structural control measures (e.g., containment, berms, detention/retention basins, grassed swales, oil/water separators); and

A. Non-Stormwater Discharges into Storm Sewers

The facility shall ensure that it does not generate and discharge, through storm sewers to surface waters, any domestic wastewater, non-contact cooling water, or process wastewaters, unless that discharge is authorized by another NJPDES permit or identified in an application or request for authorization submitted for another NJPDES permit.

B. Removal, Cover or Control of Industrial Activities

Except as specified and required in Part I.A.1. of the permit for certain, specific exposures of source materials, all other source materials shall be moved indoors, covered, used, handled, and/or stored in a manner so as to prevent contact with stormwater that is discharged to surface water. Each BMP that prevents such contact shall be identified and discussed in the SPPP.

C. Diverting Stormwater

Approved diversion of contaminated stormwater to either a domestic or industrial wastewater treatment plant may also be considered when choosing an appropriate BMP where feasible. (Diversion to groundwater may require a separate NJPDES permit. Consult the Department's Bureau of Operational Groundwater Permits.)

D. Spill Prevention and Response

Areas where actual or potential spills of source materials are exposed to stormwater discharges can occur, and their accompanying drainage points shall be identified clearly in the SPPP. Where appropriate, specific material handling procedures, storage requirements and use of equipment such as diversion valves shall be developed and practiced to prevent and/or eliminate spills and/or leaks of source materials from being exposed to stormwater. Procedures for cleaning up spills shall be specifically included in the plan and made available to the appropriate personnel through scheduled employee training. In addition, the facility shall provide or otherwise make available to its personnel the appropriate and necessary spill cleanup equipment to effect an immediate and thorough spill cleanup.

E. Good Housekeeping

The SPPP must include a good housekeeping program to help maintain a clean and orderly work place. For certain activities or areas, the discharge of stormwater exposed to source materials may be prevented merely by using good housekeeping methods. The following are some simple procedures that a facility can consider incorporating into an effective good housekeeping program:

1. conduct cleanup immediately after discovery of leaks and spills;

3. Evaluation Process

The SPPP shall include a system to routinely and continually evaluate the SPPP for effectiveness, any flaws that may have developed, and maintenance that may be required. The routine evaluation must include, but not be limited to, regular and annual inspections, inspection logs and records, internal reporting, plan revisions to correct any flaws detected in the SPPP or to reflect changes/additions at the facility, and logs of preventative maintenance performed at the facility. In addition, the Annual Reports and Certifications required under Part I.A, I.A.1. and I.A.5. are integral to the evaluation process.

VI. Implementation Schedule

The SPPP shall include an implementation schedule for all structural and non-structural BMP's including a schedule(s) for removal, coverage, minimization of exposure of source material to stormwater, and/or stormwater diversion or treatment. The schedule shall meet the deadlines established in the permit in accordance with Part I.A.

Upon completion of the initial SPPP, those BMP's (e.g., spill response, good housekeeping) that may readily be implemented shall be done so within 30 days, if not already practiced.

VII. General Plan Requirements

This section provides additional requirements on the administrative requirements related to finalizing your SPPP. It covers (1) required signatures, (2) requirements for plan location and access, and (3) required certifications.

A. Required Signatures for SPPP and Attachments 2 and 3

The SPPP and Attachments 2 and 3 shall be signed as follows:

1. for a corporation, by a principal executive officer of at least the level of vice president;

2. for a partnership or sole proprietorship, by a general partner or the proprietor respectively;

3. for a municipality, State, Federal or other agency, by either a principal executive officer or a ranking official; or

4. for 1., 2., or 3. above, by a duly authorized representative, provided that: a) the representative is authorized by a person described in 1, 2, or 3 above; (b) this authorization specifies either an individual or a position responsible for the overall operation of the regulated facility or activity (e.g., plant manager, superintendent); and (c) the written authorization is submitted to the Department.

Whenever construction activities are undertaken at the facility, the SPPP shall be amended, if necessary, so that the SPPP continues to be accurate and to meet the requirements of Part I of this permit.

APPENDIX E

AREAS OF CONCERN (AOCs)
(Question 5)

APPENDIX E-1

BULK UNDERGROUND STORAGE TANK DESCRIPTIONS

APPENDIX E-1

AREAS OF CONCERN-BULK UNDERGROUND STORAGE TANK DESCRIPTIONS

The following table is a list of underground storage tanks (USTs) currently or historically located at the facility (current/active tanks shaded). Each UST and/or UST area is designated with an appropriate AOC number. Information regarding these tanks is provided in the table. In addition, each of the AOCs are described in detain in Appendix E-6 (Narrative).

AOC Tank Area ID	Site Tank ID	# of Tanks	Tank Status	Age/History	Contents	Volume (Gals)	Const. Materials	Location/Room ID	Additional Comments	Ganes Proposes Action
AOC UTA-1	Neutral-ization Tank	1	In Use	UK (>50yrs)	Facility wastewater and/or storm water	2,000	Cedar Wood	Outside Room 1 & 24 (GSFP)	Facility Records/Site Observations (Photo #1)	~~No Further Action (NFA)~~ Proposed, see Appendix E-6 for additional descriptions. FA
AOC UTA-2	ND	2	UK/Not in Use	Installed prior to 1949 and possibly removed before 1977	Alcohol	2-550	UK	Inside Room 24 (GSFP)	Observed in 1924 and not in 1946 historical site plans	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-3	ND	1	Removed	Installed prior to 1949, removed and replaced by tank E8	Fuel Oil	15,000	UK	Outside Room 22 (GSFP)	Observed in 1924 and not in 1946 historical site plans	Further Action (FA) Proposed, see Appendix E-6 for additional descriptions.
	E8	1	Removed	Installed in 1952, removed and replaced by ND tank below	Heating Oil No. 6	15,000	Steel		Reported in EDR	
	ND	1	Removed	Installed prior to 1977, removed and replaced by tank #18	Fuel Oil	10,000	UK		Observed in 1977 historical site plan	
	18	1	Removed	Installed prior to 1981, removed and replaced by UST-8	Fuel Oil	15,000	Steel		Observed in 1981 historical site plan	
	UST-8	1	In Use	Installed in 1987, replaced tank #18	No. 6 Fuel Oil	15,000	DW carbon steel		Facility records/Site Observations (Photos #2 and #3)	
AOC UTA-4	ND	1	UK/Not in Use	Installed prior to 1949	Caustic	1,000	UK	Between Room 12 & 22 (GSFP)	Not observed in 1946 site plan. Last noted in a 1964 site plan. No other tanks have been installed in this area (Photo #2)	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-5	E2, E3 & E4	3	Removed	Installed in 1947, removed and replaced by 3 ND tanks below	1-Benzol (Isopropyl Acetone) and 2-Toluene (Toluol)	3-550	Steel	Outside Room 25 (GSFP)	Facility records	FA Proposed, see Appendix E-6 for additional descriptions.
	ND	3	Removed	Installed prior to 1977, removed and replaced by tank #s 10, 11 and 12	3 Solvent	3-500	UK		Observed in 1977 and not in 1981 historical site plan	
	10, 11 & 12	3	Removed	Installed in 1981, removed and replaced by UST-9 (E9)	1-MIBK and 2-Toluol	3-550	Steel		Facility Records	
	UST-9 (E9)	1	In Use	Installed in 1989, replaced tanks 10, 11, & 12	Toluene	2,000	Cath. protected steel		Facility Records/Site Observations (Photo #4)	

ATA=Aboveground Tank Area DW=Double Wall EDR=Environmental Database Report N/AV=Not Available ND=Not Designated UK=Unknown UTA=Underground Tank Area
GSFP=Garden Street Facility Property OSFP=Orchard Street Facility Property GSWP=Garden Street Warehouse Property SWP=Scharg Warehouse Property

APPENDIX E-1
AREAS OF CONCERN-BULK UNDERGROUND STORAGE TANK DESCRIPTIONS

AOC TANK AREA ID	SITE TANK ID	# OF TANKS	TANK STATUS	AGE/HISTORY	CONTENTS	VOLUME (GALS)	CONST. MATERIALS	LOCATION	ADDITIONAL COMMENTS	GANES PROPOSES ACTION
AOC UTA-6	ND	1	Removed	Installed prior to 1949, removed and replaced by tank 29	Caustic/Benzene	10,000	UK	Between Room 10 & 25 (GSFP)	Not observed in 1946 site plan	FA Proposed, see Appendix E-6 for additional descriptions.
	29	2	Removed	Installed between 1977 and 1981, removed and replaced by tank E1	1-Benzyl Cyanide and 1-Acetic Anhydride	2-5,000	UK		Not observed in 1977 and observed in 1981 historical site plans	
	E1	1	Removed	Installed in 1982, removed and replaced by UST-10	Acetic Anhydride	10,000	Single walled stainless st.		Facility Records	
	UST-10 (E10)	1	In Use	Installed in 1989, replaced tank E1	Acetic Anhydride	6,000	Stainless steel cath. Protected		Facility Records/Site Observations (Photo #5)	
AOC UTA-7	ND	6	Removed	Installed prior to 1949, removed and replaced by 3 ND tanks below	UK Solvent	6-550	UK	Outside corner of Room 7 & Canopy (GSFP)	Observed on 1949 historical site plan	FA Proposed, see Appendix E-6 for additional descriptions.
	ND	3	Removed	Installed prior to 1964, removed and replaced by tanks 26, 27 & 28 (E5, E6,& E7)	Caustic, Methanol, & Alcohol	3-6,000	UK		Observed on 1949 site plan	
	26, 27 & 28 (E5, E6 & E7)	3	Removed	Installed in 1971, removed and replaced by UST-5, UST-6 & UST-7	Caustic (26), Methanol (27), & Isopropynol (28)	3-5,800	A. Bare Steel D. Fiberglass Reinforced Plastic		Facility records	
	UST-5 UST-6 UST-7	3	In Use	Installed in 1986, replaced tanks 26, 27 & 28 (E5, E6 & E7)	Ethanol (UST-5), Isopropyl Alcohol (UST-6), & NaOH (UST-7)	3-6,000	DW Steel		Facility Records/Site Observations (Photos #6 and #7)	
AOC UTA-8	ND	1	UK/Not in Use	Installed prior to 1924	UK	UK	UK	Between Room 27 & 26 (OSFP)	Noted on Franco-American Works 1924 site plan	FA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-9	ND	1	UK/Not in Use	Installed prior to 1949 and possibly removed before 1977	Caustic	2,000	UK	Inside Room 27 (OSFP)	Not observed in 1946 and 1977 site plans	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-10	ND	1	In Use	Installed prior to 1949	Make Up Water from production well	20,000	UK	Inside Room 27 (OSFP)	Facility Records/Site Observations (Photo #30)	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-11	23, 24, & 25	3	Removed	Installed prior to 1949 and removed some time after 1981	UK solvents (Diethyl carbonate in 23 and 24)	3-5,000	Steel	Grass lot adj. to Room 31 (OSFP)	Observed on 1949, not on 1981 historical site plan (Photo #31)	FA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-12	ND	3	UK/Not in Use	Installed prior to 1964	UK	3-1,000	UK	Block 2 Lot 8 (GSWP)	Not observed in other site plans (Photo #33)	FA Proposed, see Appendix E-6 for additional descriptions.

ATA=Aboveground Tank Area DW=Double Wall EDR=Environmental Database Report N/AV=Not Available ND=Not Designated UK=Unknown UTA=Underground Tank Area GSFP=Garden Street Facility Property OSFP=Orchard Street Facility Property GSWP=Garden Street Warehouse Property SWP=Scharg Warehouse Property

APPENDIX E-1

AREAS OF CONCERN-BULK UNDERGROUND STORAGE TANK DESCRIPTIONS

AOC Tank Area ID	Site Tank ID	# of Tanks	Tank Status	Age/History	Contents	Volume (Gals)	Const. Materials	Location	Additional Comments	Ganes Proposes Action
AOC UTA-13	ND	1	UK/Not in Use	Installed prior to 1946	Alcohol	200	UK	Outside Room 4 (GSFP)	Observed on 1924 historical site plan (Photo #8)	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-14	ND	1	UK/Not in Use	UK	Fuel Oil	UK	UK	Outside Scharg Bldg. (SWP)	Employee Interviews (Photo #38)	FA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-15	ND	1	UK/Not in Use	UK	Fuel Oil	UK	UK	Outside Scharg Bldg. (SWP)	Employee Interviews (Photo #39)	FA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-16	Settling Tank	1	In Use	UK	Pretreated wastewater and storm water for discharge to POTW	UK	Concrete Lined Fiberglass	Outside Room 2 (GSFP)	Tank is located within a concrete sump (Photo #9)	FA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-17	HS and LB tanks	2	UK/Not in Use	Installed prior to 1924	UK	UK	UK	Former Franco-Amer. facility, near Rooms 3 & 4 (GSFP)	Not observed in other site plans	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC UTA-18	Diversion Pit	1	In Use	UK	Historically – UK Currently used for overflow from neutralization tank	UK	Vault lined with fiberglass	Underneath canopy outside Room 7 (GSFP)	Facility Records/SiteObservations (Photos #10 and #11)	FA Proposed, see Appendix E-6 for additional descriptions.

Notes:

1. All underground storage tanks present on-site were installed in compliance with N.J.A.C. 7:14B. The tanks are double walled with liquid sensors mounted in the annular space and fill sump. The control panel and leak alarm is located in the boiler room, which is manned 24 hours a day. These tanks are constructed of materials compatible with the products stored. All pipe lines have accessible valves for shut off in case of an emergency. Tanks are also equipped with conservation vents.
2. All shaded areas indicate active tanks.
3. Environmental Database Report (EDR) is provided in Appendix H-2.

ATA=Aboveground Tank Area DW=Double Wall EDR=Environmental Database Report N/AV=Not Available ND=Not Designated UK=Unknown UTA=Underground Tank Area GSFP=Garden Street Facility Property OSFP=Orchard Street Facility Property GSWP=Garden Street Warehouse Property SWP=Scharg Warehouse Property

APPENDIX E-2

BULK ABOVEGROUND STORAGE TANK DESCRIPTIONS

APPENDIX E-2

AREAS OF CONCERN-BULK ABOVEGROUND STORAGE TANK DESCRIPTIONS

The following table is a list of aboveground storage tanks (ASTs) currently or historically located at the facility (current/active tanks shaded). Each AST and/or AST area is designated with an appropriate AOC number. Information regarding these tanks is provided in the table. In addition, each of the AOCs are described in detain in Appendix E-6 (Narrative).

AOC Tank Area ID	Site Tank ID	No. & Volume (Gals) of Tanks	Tank Status	Age	Contents	Dimen-sions	Constr-uction	Location/ Room ID	Contain-ment	Additional Information	Ganes Proposed Action
AOC ATA-19	ND	1 (1,200)	Removed	Installed prior to 1946, removed before 1977 and replaced by tank ND below	Sulfuric Acid	UK	UK	(GSFP) Outside south wall of Room 22	UK	No information available	No Further Action (NFA) proposed, see Appendix E-6 for additional descriptions.
	ND	1 (UK)	Removed	Installed prior to 1946, removed before 1977 and replaced by tank Acid Transfer Tank 1	Acid	UK	UK		UK	Located on concrete pad	
	Acid Transfer Tank 1	1 (~160)	In Use	Pre-1977	Acid	28"x5'	Steel		Secondarily Contained	No leaks or spills observed (Photos #2 and #12)	
AOC ATA-20	AST-35	1 (6,000)	In Use	UK	Propylene Glycol	6'x28'	Fiberglass	(GSFP) South of canopy & Room 18	None	(Photos #2 and #3)	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC ATA-21	ND	1 (2,500)	Removed	Installed prior to 1949, removed and replaced by 3 ND tanks below	Sulfuric Acid	UK	UK	(GSFP) Located west of Room 33 and north of Room 7and canopy	UK	No information available	NFA Proposed, see Appendix E-6 for additional descriptions.
	ND	3 (3,000)	Removed	Installed prior to 1964, removed prior to 1977 and replaced by tanks 13, 14 & 15	Sulfuric Acid	UK	UK		UK	No information available	
	13, 14 & 15	3 (5,000)	Removed	Installed prior to 1977, removed prior to 1998 and replaced by tanks15, 25, & 13	Sulfuric Acid	UK	UK		UK	No information available	
	AST-15 AST-25 AST-13	3 (4,000)	In Use	Installed in 1998	Xylene (AST-15), Sulfuric Acid (AST-25) & Acetic Acid (AST-13)	6'x19'	Steel		Secondarily Contained	(Photos #6 and #13)	
	ND	1 (1,000)	Removed	Installed prior to 1964	Empty	UK	UK		UK	Not noted on 1977 site plan	
	P-6	1 (6,000)	Idle	UK	Alcohol/water/ salt mixture	8'x16'	Fiberglass		Secondarily Contained	No leaks or spills observed	
	ND	1 (6,000)	Removed	Installed prior to 1981 removal date UK	Waste Acid	UK	UK		UK	No information available	

ATA=Aboveground Tank Are DW=Double Wall N/AV=Not Available ND=Not Designated UK=Unknown GSFP=Garden Street Facility Property OSFP=Orchard Street Facility Property GSWP=Garden Street Warehouse Property SWP=Scharg Warehouse Property

APPENDIX E-2

AREAS OF CONCERN-BULK ABOVEGROUND STORAGE TANK DESCRIPTIONS

AOC Tank Area ID	Site Tank ID	No. & Volume (Gals) of Tanks	Tank Status	Age	Contents	Dimensions	Construction	Location/ Room ID	Containment	Additional Information	Ganes Proposed Action
AOC ATA-22	Acid Drop Tank 2	1 (~160)	In Use	UK	Acid	28"x5'	UK	(GSFP) Outside Room 4	None	No leaks or spills observed (Photos #8 and #14)	NFA Proposed, see Appendix E-6 for additional descriptions.
	P-5	1 (~500)	Inactive	UK	Empty (former process tank)	5'x4'	Plastic	Outside Room 5 (GSFP)	None	No leaks or spill observed	
AOC ATA-23	Acid Drop Tank 1	1 (~160)	In Use	UK	Acid	28"x5'	Steel	(GSFP) Outside west wall of Room 24	None	No leaks or spills observed (Photos #1 and #15)	NFA Proposed, see Appendix E-6 for additional descriptions.
	Acid Tank	1 (2,000)	In Use	UK	Sulfuric Acid	5'x4'	Plastic		None	No leaks or spill observed (Photos #1 and #15)	
AOC ATA-24	ND	2 (<1,000)	Removed	UK	Ethanol & Monomethanaline	UK	Steel	(GSFP) Walkway between Rooms 21 & 1	None	No information available	NFA Proposed, see Appendix E-6 for additional descriptions.

Notes:

1. All shaded areas indicate active tanks

ATA=Aboveground Tank Are DW=Double Wall N/AV=Not Available ND=Not Designated UK=Unknown GSFP=Garden Street Facility Property OSFP=Orchard Street Facility Property GSWP=Garden Street Warehouse Property SWP=Scharg Warehouse Property

G:\STAFF\SHARED\Ganes\Reports\Prel Assessment\Appendix\Appendix E\E-2AOC_ATA.doc

APPENDIX E-3

MATERIAL STORAGE AREA DESCRIPTIONS

APPENDIX E-3

AREAS OF CONCERN-MATERIAL STORAGE AREA DESCRIPTIONS

The following table is a list of material storage areas (MSAs) currently or historically located at the facility. Each MSA and/or MSA area is designated with an appropriate AOC number. Information regarding these MSAs is provided in the table. In addition, each of the AOCs are described in detain in Appendix E-6 (Narrative).

AOC Material Storage Area ID	Site ID	Location	Type of Storage	Description	Dates	Capacity/ Approx. Area	Storage Surface	Integrity	Information Sources	Ganes Proposed Action
AOC MSA-25	Garden Street Warehouse	GSWP	Indoor	Storage of raw materials (powder and liquid) in containers.	>1964 to Present	10,400 ft^2	Concrete floor with trenches along perimeter walls	Concrete in good condition	DPPC, Site Observations (Photos #34 and #35)	Further Action (FA) Proposed as part of AOC DS-83, see Appendix E-6 for additional descriptions.
AOC MSA-26	Garden Street Warehouse Outside Storage Pad	GSWP	Outdoor	Material storage in plastic and metal drums.	>1964 to Present	1600 max drums 88,000 max gallons	Impermeable concrete pad that is curbed and sloped towards a sump	Concrete in very good condition	DPPC Site Observations (Photos #35 and #36)	FA Proposed, see Appendix E-6 for additional descriptions.
AOC MSA-27	Sodium Storage Building	GSWP	Indoor	Storage of sodium, lithium diisopropyl amide and other water reactive materials in containers ranging from 1 to 120 gallons.	>1964 to Present	338 ft^2	Concrete floor that is diked along door. No floor drains are present.	Concrete floor in good condition	DPPC Site Observations	FA Proposed, see Appendix E-6 for additional descriptions.
	West side of Sodium Storage Building	GSWP	Outdoor	Alleged area of historical chemical releases.	UK	100 ft^2	Grassed area	N/AP	Interviews with Ganes employees	
AOC MSA-28	Empty Drum Storage Area	GSWP	Outdoor	Staging area for empty drums and municipal waste dumpster. Also historically used to store excavated soil from toluene tank removal and currently storing fill material.	UK to Present	7,200 ft^2	Gravel pad & concrete roadway	N/AP	DPCC Site Observations (Photos #33 and #37)	FA Proposed, see Appendix E-6 for additional descriptions.
		GSWP	Outdoor	Storage of empty drums and carboys, muriatic acid in carboys, residue in drums and formice.	<1964 to <1977	~7,200 ft^2	Grassed Area	UK	1964 Site Plan Not designated on later plans (Photos #33 and #37)	
AOC MSA-29	Room 17 (Basement) (W)	GSFP	Indoor	Storage of light machinery, machine oil, dimethyl urea and empty containers.	<1949 to Present	2,100 ft^2	Concrete floor with sump and floor drains. Observed former sump areas.	Concrete in good condition	– 1949 & 1964 Site Plans	FA Proposed as part of AOC-DS-59, see Appendix E-6 for additional descriptions.
AOC MSA-30	Garden Street Facility Hazardous Waste Storage Pad	GSFP	Outdoor	Hazardous waste liquids are stored in 55-gal. steel and/or plastic drums.	UK to Present	100 max. drums 5,500 max gallons	Impermeable concrete pad that is sloped toward a sump.	Concrete in good condition	DPCC Site Observations (Photos #2, #3, and #16)	FA Proposed as part of AOC-DS-73, see Appendix E-6 for additional descriptions.

GSFP=Garden Street Facility Property *GSWP=Garden Street Warehouse Property* *N/AP=Not Applicable* *N/AV=Not Available* *ND=Not Designated* *OSFP=Orchard Street Facility Property* *UK=Unknown*

APPENDIX E-3

AREAS OF CONCERN-MATERIAL STORAGE AREA DESCRIPTIONS

AOC Material Storage Area ID	Site ID	Location	Type of Storage	Description	Dates	Capacity/ Approx. Area	Storage Surface	Integrity	Information Sources	Ganes Proposed Action
AOC MSA-31	Tanker Truck Loading/Unloading area	GSFP	Outdoor	Loading/unloading area for materials and/or hazardous wastes	UK to Present	1,800 ft^2	Impermeable concrete with drainage trenches that lead to sumps/ containment	Concrete in good condition	DPCC Site Observations (Photos #2, #3, #4, and #17)	FA Proposed as part of AOC–DS-74, see Appendix E-6 for additional descriptions.
AOC MSA-32	Room 33	GSFP	Indoor	Storage of processing chemicals	<1949 to Present	1,000 ft^2	Concrete floor with trenches along wall perimeter	Concrete in good condition	1949 & 1964 Site Plans	FA Proposed as part of AOC DS-65, see Appendix E-6 for additional descriptions.
AOC MSA-33	Cyanide Building (Shed/Ice House)	GSFP	Indoor	Historical location of Cyanide Building	<1946 to <1977	~800 ft^2	UK	UK	Designated as cyanide storage in 1946 Site Plan	FA Proposed, see Appendix E-6 for additional descriptions.
AOC MSA-34	Garden Street Facility Courtyard	GSFP	Outdoor	Storage of raw and in-process materials in 330-gallon totes, 55-gallon plastic/steel drums.	UK to Present	1,500 ft^2	Impermeable concrete with curbing	Concrete in good condition	DPCC Site Observations (Photos #6, #8, and #18)	FA Proposed as Part of AOC DS-66, see Appendix E-6 for additional descriptions.
		GSFP	Outdoor	Drum storage	<1949 to <1964	~1,500 ft^2	Concrete pad	UK	1949 Site Plan only (Photos #6, #8, and #18)	
AOC MSA-35	Canopy Area	GSFP	Canopied	Storage of hydrochloric acid in carboys	<1946 to <1949	300 ft^2	UK	UK	1946 & 1949 Site Plans	No Further Action (NFA) Proposed, see Appendix E-6 for additional descriptions.
AOC MSA-36	Room 11 (Q)	GSFP	Indoor	Storage of metallic sodium in drums. Also former pilot plant.	<1946 to UK	530 ft^2	Concrete floor with trenching	Concrete in good condition	Noted in 1946 Site Plan only	FA Proposed as part of AOC DS-58, see Appendix E-6 for additional descriptions.
AOC MSA-37	Room 22 (G)	GSFP	Indoor	Storage of machine oil in drums and compressors.	<1946 to Present	340 ft^2	Concrete floor with trenching	Concrete in good condition	1946, 1949 & 1964 Site Plans (see Photo #19 for current operations)	FA Proposed as part of AOC DS-63, see Appendix E-6 for additional descriptions.
AOC MSA-38	Quality Control Building	GSFP	Indoor	Houses several laboratories that test raw materials, in-process materials and finished products. Materials are stored in containers of 5 gallons or less.	1989 to Present	2,400 ft^2	Tiled concrete floor with floor drains.	Floor in good condition	DPCC Plan & site observations Building not noted on available Site Plans	NFA Proposed, see Appendix E-6 for additional descriptions.

GSFP=Garden Street Facility Property GSWP=Garden Street Warehouse Property N/AP=Not Applicable N/AV=Not Available ND=Not Designated OSFP=Orchard Street Facility Property UK=Unknown

APPENDIX E-3
AREAS OF CONCERN-MATERIAL STORAGE AREA DESCRIPTIONS

AOC MATERIAL STORAGE AREA ID	SITE ID	LOCATION	TYPE OF STORAGE	DESCRIPTION	DATES	CAPACITY/ APPROX. AREA	STORAGE SURFACE	INTEGRITY	INFORMATION SOURCES	GANES PROPOSED ACTION
AOC MSA-39	Research & Development Building	GSFP	Indoor	Houses several laboratories that conduct research on potential products and further development of existing products. Materials are stored in containers of 5 gal. or less. Currently renovated for office space.	1981 to Present	2,200 ft^2	Tiled concrete floor with floor drains.	Floor in good condition	DPCC Plan & site observations Lab not noted on available Site Plans	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC MSA-40	Room 27 (Packing Building)	OSFP	Indoor	Storage of aminophyline, phenobarbital and pentobarbital and processing room.	<1946 to <1949	1,350 ft^2	Concrete floor with trenching	Concrete floor in good condition	1946 Site Plan	FA Proposed as part of AOC DS-76, see Appendix E-6 for additional descriptions.
AOC MSA-41	Room 28 (Store House)	OSFP	Indoor	Storage of diethyl carbonate, ethyl bromide, oil, alcohol, salt, trisodium phosphate, calcium chloride, sodium nitrite, diethyl sulfate, soda ash, sodium acetate, sodium phosphate, oil, sodium cyanide and sodium hydrosulfite.	<1946 to >1964	1,800 ft^2	Concrete floor with trenching	Concrete floor in good condition	1946, 1949 & 1964 Site Plans (Photo #30)	FA Proposed as part of AOC DS-77, see Appendix E-6 for additional descriptions.
AOC MSA-42	Room 30	OSFP	Indoor	Storage of diethyl carbonate, ethyl bromide, oil, alcohol, salt, trisodium phosphate, calcium chloride, sodium nitrite, diethyl sulfate, and sodium cyanide (Storage of DEA-controlled materials).	<1949 to UK	1,800 ft^2	Concrete floor with trenching	Concrete floor in good condition	1949 and 1964 Site Plans	FA Proposed as part of AOC DS-79, see Appendix E-6 for additional descriptions.
AOC MSA-43	Former Warehouse Room 29	OSFP	Indoor	Storage of alcohol in steel drums and machinery.	<1946 to <1949	450 ft^2	UK	UK	1946 Site Plan	FA Proposed as part of AOC DS-78, see Appendix E-6 for additional descriptions.
AOC MSA-44	Room 32	OSFP	Indoor	Storage caustic soda, chloroacetic acid, urea, iron powder, ammonia and finished product.	<1949 to UK	2,200 ft^2	Concrete floor with trenching	Concrete floor in good condition	1949 & 1964 Site Plans (Photo #32)	NFA Proposed, see Appendix E-6 for additional descriptions.
AOC MSA-45	Orchard Street Facility Outside Storage	OSFP	Outdoor	Storage of raw and in-process materials in plastic and metal drums.	UK to Present	1,080 ft^2	Concrete pad/ Hazardous waste stored on spill pallets	Concrete in very good condition	DPCC Site Observations	FA Proposed, see Appendix E-6 for additional descriptions.
AOC MSA-46	ND	OSFP	Outdoor	Historical storage of acetic anhydride and mother liquors in drums.	<1946 to <1964	~1,000 ft^2	Grassed Area	NA/P	1946 & 1949 Site Plans (Photo #31)	FA Proposed, see Appendix E-6 for additional descriptions.

GSFP=Garden Street Facility Property GSWP=Garden Street Warehouse Property N/AP=Not Applicable N/AV=Not Available ND=Not Designated OSFP=Orchard Street Facility Property UK=Unknown

APPENDIX E-3
AREAS OF CONCERN-MATERIAL STORAGE AREA DESCRIPTIONS

AOC Material Storage Area ID	Site ID	Location	Type of Storage	Description	Dates	Capacity/ Approx. Area	Storage Surface	Integrity	Information Sources	Ganes Proposed Action
AOC MSA-47	Orchard Street Warehouse Room 31	OSFP	Indoor	Storage of finished goods in powder form and stored in containers up to 44 gallons and processing room.	UK	~1,900 ft^2	Impermeable concrete floor with trenches along perimeter of room	Concrete floor in good condition	DPCC Site Observations	NFA Proposed, see Appendix E-6 for additional descriptions.

GSFP=Garden Street Facility Property GSWP=Garden Street Warehouse Property N/AP=Not Applicable N/AV=Not Available ND=Not Designated OSFP=Orchard Street Facility Property UK=Unknown

APPENDIX E-4

DRAINAGE SYSTEM DESCRIPTIONS

APPENDIX E-4
AREAS OF CONCERN-DRAINAGE SYSTEMS DESCRIPTIONS

The following table is a list of drainage systems (DSs) currently or historically located at the facility. Each DS and/or DS area is designated with an appropriate AOC number. Information regarding these DSs is provided in the table. In addition, each of the AOCs are described in detain in Appendix E-6 (Narrative).

AOC Drainage Area ID	Locat-ion	Room No.	Type	Drainage Area Status	Contents	Volume (Gals)	Dimensions (L.F.)	Construction Materials	Integrity	Additional Information	Ganes Proposed Action
AOC DS-48	GSFP	1	Trench	Active	Process Water	N/AP	85	Concrete/Terra Cotta	New	New floor and trench	Further Action (FA) Proposed, see Appendix E-6 for additional description.
			Sump	Removed	Process Water	~50	N/AP	Steel	Poor	Sump was removed 1999; sump was corroded and pitted. (Photos #20 and #21)	
AOC DS-49	GSFP	2	Trench	Active	Process Water	N/AP	1300	Concrete/Terra Cotta	Fair	None	FA Proposed, see Appendix E-6 for additional descriptions.
		2 (Basement)	Trench	Active	Process Water	N/AP	44	Concrete	Poor	Stagnant water with oily sheen observed	
		2 (Basement)	Sump	Active	Process Water	~50	N/AP	Concrete	Fair	Open Grate Sump	
AOC DS-50	GSFP	3	Trench	Active	Process Water	N/AP	20	Concrete/Terra Cotta	Fair	Areas of deterioration & corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Closed	Process Water	~50	N/AP	Concrete	UK	Large vault	
AOC DS-51	GSFP	4	Trench	Closed	Process Water	N/AP	91	Concrete/Terra Cotta	Fair	Areas of deterioration & corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Process Water	~50	N/AP	Concrete	Fair	None	
AOC DS-52	GSFP	5	Trench	Active	Process Water	N/AP	78	Concrete/Terra Cotta	Fair	Areas of deterioration & corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
			Trench	Closed	Process Water	N/AP	38	Concrete	UK	None	
AOC DS-53	GSFP	6	Trench	Active	Process Water	N/AP	78	Concrete/Terra Cotta	Good	New floor, painted	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-54	GSFP	7	Trench	Active	Process Water	N/AP	110	Concrete/Terra Cotta	Good	New floor, painted	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-55	GSFP	8	Trench	Active	Process Water	N/AP	140	Concrete/Terra Cotta	Poor	Historical use of bromine and other halogenated compounds in area	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-56	GSFP	9	Trench	Active	Process Water	N/AP	140	Concrete/Terra Cotta	Poor	Toluene use in area. Areas of deterioration & corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
			Sink	Active	Sanitary	N/AP	N/AP	N/AP	N/AP	Drains to trench	

GSFP=Garden Street Facility Property GSWP=Garden Street Warehouse Property N/AP=Not Applicable N/AV=Not Available ND=Not Designated OSFP=Orchard Street Facility Property UK=Unknown

APPENDIX E-4
AREAS OF CONCERN-DRAINAGE SYSTEMS DESCRIPTIONS

AOC DRAINAGE AREA ID	LOCATION	ROOM NO.	TYPE	DRAINAGE AREA STATUS	CONTENTS	VOLUME (GALS)	DIMENSIONS (L.F.)	CONSTRUCTION MATERIALS	INTEGRITY	ADDITIONAL INFORMATION	GANES PROPOSED ACTION
AOC DS-57	GSFP	10	Floor Drain	Closed	Process Water	N/AP	N/AP	Concrete/Terra Cotta	UK	None	FA Proposed, see Appendix E-6 for additional descriptions.
			Sink	Active	Sanitary	N/AP	N/AP	Plastic	N/AP	Drains to trench	
AOC DS-58	GSFP	11	Trench	Closed	Waste/Wash Water	N/AP	21	Concrete/Terra Cotta	UK	(Photo #22)	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Closed	Waste/Wash Water	N/AP	N/AP	Concrete	UK	None	
			2 Floor Drains	Closed	Process Water	N/AP	N/AP	Concrete/Terra Cotta	UK	(Photo #22)	
AOC DS-59	GSFP	17 Basement	Trench	Closed	Spill Containment	N/AP	N/AP	Concrete	UK	None	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Groundwater/ Petroleum	N/AP	~1'x1'x2'	Stone/Earth	Poor	Open earth sump (Photo #23)	
			Floor Drain	Closed	Spill Containment	N/AP	N/AP	Concrete	UK	None	
AOC DS-60	GSFP	18	5 Floor Drains	Active	Process Water	N/AP	N/AP	Concrete	UK	None	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-61	GSFP	20	Trench	Active	Boiler Blowdown	N/AP	77	Concrete/Terra Cotta	Poor	Areas of deterioration and corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
			Trench	Closed	Boiler Blowdown	N/AP	35	Concrete	Conc. Closed	None	
AOC DS-62	GSFP	21	Floor Drain	Active	Compressor Blowdown	N/AP	N/AP	Concrete	Fair	Cracked floor	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-63	GSFP	22	Trench	Closed	Compressor Blowdown	N/AP	22	Concrete	UK	(Photo #19)	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-64	GSFP	24	Trench	Active	Process Water	N/AP	75	Concrete/Terra Cotta	Fair	Areas of deterioration and corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-65	GSFP	33	Trench	Active	Process Water	N/AP	72	Concrete	Good	New painted floor	FA Proposed, see Appendix E-6 for additional descriptions.
			2 Floor Drains	Active	Process Water	~5	N/AP	Concrete	UK	Could not access floor drains	
AOC DS-66	GSFP	Rooms 1, 24, & 4 Outside Area	2 Storm Drains	Active	Storm Water	~20	N/AP	Concrete	UK	Could not access storm drains	FA Proposed, see Appendix E-6 for additional descriptions.
			Drainage Swale	Active	Storm Water	N/AP	60	Concrete	Good	Areas of corrosion	
AOC DS-67	GSFP	Rooms 2, 20, 21 & Canopy Area	Drainage Swale	Active	Storm Water	N/AP	32	Concrete	Good	Covered under canopy	FA Proposed, see Appendix E-6 for additional descriptions.
			3 Storm Inlets	Active	Storm Water	~20	N/AP	Concrete	UK	Could not open storm drains	

Room 35

GSFP=Garden Street Facility Property GSWP=Garden Street Warehouse Property N/AP=Not Applicable N/AV=Not Available ND=Not Designated OSFP=Orchard Street Facility Property UK=Unknown

APPENDIX E-4
Areas of Concern-Drainage Systems Descriptions

AOC Drainage Area ID	Locat-ion	Room No.	Type	Drainage Area Status	Contents	Volume (Gals)	Dimensions (L.F.)	Construction Materials	Integrity	Additional Information	Ganes Proposed Action
AOC DS-68	GSFP	Rooms 6 & 7 Canopy Area	Drainage Swale	Active	Storm Water	N/AP	32	Concrete	Good	No deterioration or corrosion	No Further Action (NFA) Proposed, see Appendix E-6 for additional descriptions.
			Gutter Inlet	Active	Storm Water	N/AP	N/AP	Concrete/Steel	N/AP	N/AP	
			2 Clean Outs	Active	Storm Water	N/AP	N/AP	Steel	UK	N/AP	
AOC DS-69	GSFP	Room 7 Canopy/ Diversion Pit	Diversion Pit	Active	Wastewater	>10,000	N/AP	Fiberglass lined Concrete	Good	Diversion pit below grade (Photos #10 and #11)	FA Proposed as part of AOC UTA-18, see Appendix E-6 for additional descriptions.
AOC DS-70	GSFP	Rooms 7, 8, & 9 Outside Area	Process Sewer	Active	Process Water	N/AP	170	UK/Below grade	UK	Process sewer to neutralization tank	FA Proposed, see Appendix E-6 for additional descriptions.
			2 Sumps	Active	Process Water	~5	N/AP	Concrete	Fair	Process sump from Rooms 7 & 9	
			5 Clean Outs	Active	Process Water	N/AP	N/AP	Steel	UK	Cleanouts for process sewer	
AOC DS-71	GSFP	Outside East of Room 17	Trench	Active	Cooling Water	N/AP	37	Terra Cotta	Fair	Outside trench/open grate; from east half of Room 17 drains to sump.	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Cooling Water	~250	N/AP	Concrete Lined Fiberglass	Fair	Wastewater sump pumps to neutralization tank	
AOC DS-72	GSFP	Outside Between Rooms 17 & 20	Trench	Active	Wastewater	N/AP	15	UK	Unknown	From Boiler Room, ties into sump below grade	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Wastewater	~250	4' dia. x 4'	Fiberglass	Fair	Wastewater sump pumps to neutralization tank; Photo #24	
			Storm Inlet	Active	Storm Water	~20	2'x2'	Concrete	UK	Ties into sump below grade	
AOC DS-73	GSFP	Room 22, UST-8 & HazWaste Storage Pad	Trench	Active	Storm Water/ Haz Waste	N/AP	8	Concrete	Fair	Open grate for hazardous waste storage pad	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-74	GSFP	Room 33 & Loading/ Unloading Area	Trench	Active	Storm Water/ Spill Containment	N/AP	96	Concrete	Fair	Open grate for unloading area (Photos #3 and #4)	NFA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Storm Water/ Spill Containment	~50	N/AP	Concrete	Fair	Pumps from drainage swale into AST tank farm secondary containment (if spill occurs)	

GSFP=Garden Street Facility Property GSWP=Garden Street Warehouse Property N/AP=Not Applicable N/AV=Not Available ND=Not Designated OSFP=Orchard Street Facility Property UK=Unknown

APPENDIX E-4
AREAS OF CONCERN-DRAINAGE SYSTEMS DESCRIPTIONS

AOC Drainage Area ID	Locat-ion	Room No.	Type	Drainage Area Status	Contents	Volume (Gals)	Dimensions (L.F.)	Construction Materials	Integrity	Additional Information	Ganes Proposed Action
AOC DS-75	OSFP	26	Trench	Active	Process Water	N/AP	128	Concrete	Good	New floor, trenches	NFA Proposed, see Appendix E-6 for additional descriptions.
			Sink	Active	Sanitary Waste Water	N/AP	N/AP	N/Ap	N/AP	Drains to trench	
AOC DS-76	OSFP	27	Trench	Active	Process Water	N/AP	113	Concrete	Good	Drains to sump.	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Process Water	~50	N/AP	Concrete	UK	Pumps to neutralization tank	
			Sink	Active	Sanitary Waste Water	N/AP	N/AP	N/AP	N/AP	Drains To sump	
AOC DS-77	OSFP	28	Trench	Closed	Spill Containment	N/AP	52	Concrete	Concrete Closed	(Photo #30)	FA Proposed, see Appendix E-6 for additional descriptions.
			Floor Drain	Active	Process Water	N/AP	N/AP	Concrete	UK	None	
AOC DS-78	OSFP	29	Trench	Active	Process Water	N/AP	88	Concrete	Good	Some corrosion and deterioration	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-79	OSFP	30	Trench	Active	Spill Containment	N/AP	28	Concrete	Good	No deterioration or corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
AOC DS-80	OSFP	31	Trench	Active	Process Water	N/AP	95	Concrete	Good	No corrosion or deterioration	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Process Water	~20	N/AP	Steel	UK	In ground process vessel	
			Clean Out	Active	Process Water	N/AP	N/AP	Concrete	UK	In Process Trench	
AOC DS-81	OSFP	32	Trench	Active	Process Water	N/AP	46	Concrete	Good	No deterioration or corrosion	FA Proposed, see Appendix E-6 for additional descriptions.
			Sump	Active	Process Water	~50	N/AP	Concrete	Good	Pumps to Room 27	
AOC DS-82	OSFP	Room 31 Outside Area	Drainage Swale	Active	Storm Water	N/AP	55	Concrete	Good	Drains from drum storage Pad/Recently Installed	NFA Proposed, see Appendix E-6 for additional descriptions.
			Drainage Inlet	Active	Storm Water	N/AP	N/AP	Concrete/Steel	UK	Recently installed	
			Vault	UK	UK	~20	N/AP	Concrete	UK	Recently installed	
AOC DS-83	GSWP	Drum Storage Warehouse	Trench	Active	Spill Containment	N/AP	~500	Concrete	Poor	No spills reported. One area of deterioration/corrosion (Photo #34)	FA Proposed, see Appendix E-6 for additional descriptions.
			Sumps	Active	Spill Containment	~20	UK	Concrete	UK	No spill reported.	

GSFP=Garden Street Facility Property GSWP=Garden Street Warehouse Property N/AP=Not Applicable N/AV=Not Available ND=Not Designated OSFP=Orchard Street Facility Property UK=Unknown

APPENDIX E-5

BUILDING INTERIOR AND OTHER AOC DESCRIPTIONS

APPENDIX E-5

BUILDING INTERIOR AND OTHER AOC DESCRIPTIONS

The following is a description of building interiors which includes description of process vessels, product lines and waste treatment. Each room's process trenching system has been identified as an AOC (described in Discharge Systems) and therefore, no other building interior areas were identified. The descriptions of manufacturing operations include chemical processes such as halogenation, reductive amination, diazotization, metallic sodium reactions, esterifications, alkylations, hydrogenations, condensation reactions, reductions, oxidations, etc.

All chemical processing areas are located on the Garden Street and Orchard Street Facility Properties. In general, raw materials are used in the manufacturing of pharmaceutical end-products using batch processing production techniques. Manufacturing operations conducted at the property are strictly regulated by the Federal Drug Administration (FDA) and most of the operations were and are conducted under proprietary conditions. All materials are typically brought in to a given processing room in a discrete container (i.e. drum, tote) and processed using a number of the chemical processes identified above according to specific "recipes" for a given product batch. Several vessels are used in the manufacture of each product. Equipment utilized on-site may include reaction vessels, crystallizers, distillers, dryers, autoclaves, centrifuges, and/or evaporators. Strict adherence to the recipe and to quality control procedures is documented on Batch Log Records (BLR's).

Numerous process kettles, centrifuge condensers, drop tanks, pressure filters, shakers, marmites, and vacuum blenders are maintained within the manufacturing rooms at the OSFP and GSFP. Table 1 provided below provides a list of the process equipment located in each room. Each manufacturing room maintains process floor trenching. Any spill or releases from the process equipment and associated product lines would be contained within the trenching systems.

The following table provides the number and type of manufacturing equipment located in each of the rooms utilized in the manufacturing operation at the GSFP and OSFP.

Table 1

Room No.	2	3	4	5	6	7	8	9	17	20	24	33	26	27	29	31
Brine Condenser	--	--	--	1	1	2	--	2	2	--	1	1	--	--	--	--
Condenser	6	2	1	5	4	9	7	9	7	--	2	4	4	3	--	--
Centrifuge	3	--	--	1	--	3	--	3	3	--	1	--	1	2	--	1
Drop Tank	5	1	3	5	--	1	7	6	4	--	2	1	1	1	--	2
Distiller	--	1	--	--	5	3	--	--	--	--	--	--	1	--	--	4
Fitz Mill	--	--	--	--	--	--	--		--	--	--	--	--	--	1	--
Kettle	10	1	5	8	--	9	10	11	9	1	2	4	3	3	--	2
Marmite	--	--	--	2	--	--	--	--	1	--	--	--	--	1	--	--
Pressure Filters	2	--	1	--	--	2	2	2	3	--	--	--	1	1	--	1
Packed Scrubber	--	--	1	--	--	1	3	1	--	--	--	--	--	--	--	--
Still or Sump	6	--	--	1	--	3	1	3	3	5	1	--	1	2	--	1
Shaker	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--
Storage Tank	--	--	1	--	--	--	3	2	--	--	1	--	--	2	--	--
Tank	24	1	6	6	5	9	7	10	8	11	3	5	4	3	--	--

Room No.	2	3	4	5	6	7	8	9	17	20	24	33	26	27	29	31
Vacuum Pump	5	2	2	3	6	6	3	5	6	2	3	4	4	1	--	3
Vacuum Blender	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--
Venturi Scrubber	1	--	--	--	--	2	--	1	2	--	--	--	--	1	--	1

LOADING AND TRANSFER LINES

All chemical processing areas are located in the GSFP and OSFP. According to plant operations personnel, a given product could have been processed in almost any of the processing rooms on-site. Most of all raw materials and/or products are transferred as a batch by drum or other bulk container or device. However, product transfer lines are present at the facility. These include glass piping transfer lines as indicated below:

- Room 9 to Room 27
- Room 26 to Room 4
- Room 2 to Room 9 (glass lined)
- Room 33 to Room 5
- Room 5 to 290 Kettle
- Room 26/27 Pit to Neutralization Tank

Similarly, raw material transfer lines are also present on-site. These include:

- Tank Farm to Scale
- Room 24 to Room 8 (Caustic line)
- Tank Farm to Room 8 (Xylene)
- Weigh Tank/Vats to Room 1 Tank (Sulfuric Acid)
- UST-10 (Acetic Anhydride) to Room 9
- Room 9 to Outside Storage Tank (Recovered Acetic Acid)

BOILER ROOM

The boiler room is located in room 17 of the GSFP. Heat is generated from two fuel oil fired boilers. The northern and western portions of the boiler room are also used for manufacturing. The boiler room also contains several active trenches and one closed trench and is identified as an area of concern (AOC – DS-61).

AIR VENTS AND DUCTS

The facility maintains numerous air vents and ducts throughout the Garden Street and Orchard Street properties. The Garden Street property is entirely covered with structures and/or concrete and any discharges of impacted storm water would be directed to multiple storm drains. The majority of the Orchard Street property is also covered with structures and/or concrete with the exception of the southwest corner. Any discharges of impacted storm water would be directed to the storm water drainage system for ultimate discharge to the utility authority. The grassy area maintains a storm water swale (AOC-DS-82) which also discharges to the on-site storm water drainage system for ultimate discharge to the utility authority.

Table 2 provides a description of Other AOCs identified at the site.

Table 2

AOC	AOC ID	LOCATION	ROOM NO.	DATE INSTALLED	CONTENTS	DEPTH (FEET)	ADDITIONAL INFORMATION	GANES PROPOSED ACTION
84	Transformer	GSFP	Basement of Room 3	UK	Oil	N/AP	Owned and operated by PSE&G	No Further Action (NFA) Proposed, see Appendix E-6 for additional descriptions.
85	Transformer	SWP	South of Office Building	1981	Oil	N/AP	Owned and operated by PSE&G	NFA Proposed, see Appendix E-6 for additional descriptions.
86	Transformer	OSFP	Outside south side Room 26	1998	Oil	N/AP	Owned and operated by PSE&G	NFA Proposed, see Appendix E-6 for additional descriptions.
87	Production Well #2	OSFP	Room 32	UK	Groundwater	375	Used for production water	Further Action (FA) Proposed, see Appendix E-6 for additional descriptions.
88	Production Well #5	OSFP	Grassed Area southwest of Room 31	1969	Groundwater	586	Used for production water	FA Proposed, see Appendix E-6 for additional descriptions.
89	Production Well #4	GSWP	Northeast corner of lot	UK	Groundwater	395	Used for Production water	FA Proposed, see Appendix E-6 for additional descriptions.

Notes:
GSFP=Garden Street Facility Property
GSWP=Garden Street Warehouse Property
OSFP=Orchard Street Facility Property
SWP=Scharg Warehouse Property
N/AP=Not Applicable
UK=Unknown

APPENDIX E-6

AREAS OF CONCERN NARRATIVE

GEE
"50pk

APPENDIX E-6

AREAS OF CONCERN NARRATIVE

In accordance with N.J.A.C. 7:26E3.1(c)1.v., the following section provides a narrative for each area of environmental concern (AOC) associated with bulk underground tank areas (UTAs); bulk aboveground tank areas (ATAs); material storage areas (MSAs) including but not limited to, storage pads, dumpsters, loading or transfer areas, and hazardous material storage or handling areas; drainage system areas (DS) including but not limited to, floor drains, trenches, piping, sumps, process areas sinks, storm sewer systems, roof leaders, and waste water collection systems; and other areas of concern including waste piles, transformers, and production wells. If sampling is proposed and is feasible, it will be conducted in accordance with N.J.A.C. 7:26E.

To simplify the organization of AOCs, descriptions have been categorized by facility area (parcel block) and further by lot for the four areas of the facility, which include the following:

1. The Garden Street Facility Property (GSFP) (Block 18, Lots 6-10)
2. The Orchard Street Facility Property (OSFP) (Block 19, Lots 9-11)
3. The Garden Street Warehouse Property (GSWP) (Block 2, Lot 8)
4. The Scharg Warehouse Property (SWP) (Block 23, Lots 1, 2, 1A, & 1B)

Additionally, due to the complexity of the property structures, history and number of AOCs identified in the general areas, areas will be address by the appropriate lot number, in doing so, the AOC identification numbering system does not progress in numerical order throughout this narrative. A description of the property and structures is provided in the Site Plan (Sheet 1 of 4) attached under the "Figures" section in the front of this document.

The following Figures are attached as Appendix J - Areas of Concern Maps:

Areas of Concern – Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Which includes:

- Bulk underground storage tank areas (UTAs)
- Bulk aboveground storage tank areas (ATAs)
- Wastewater treatment tanks

Areas of Concern – Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Which includes:

- Storage pads
- Hazardous materials storage areas
- Hazardous materials handling areas
- Loading and unloading areas
- Dumpsters
- Transformers
- Production Wells

Areas of Concern – Drainage Systems (Appendix J-3, Sheet 4 of 4)

Which includes:

- Floor drains (FD)
- Sinks
- Trenching
- Sumps
- Storm sewer collection systems
- Wastewater collection system

Information used to validate and justify recommendations within this narrative were obtained from the following:

- Site visits and observation made on November 2, 1999, December 8, 1999, January 11, 2000 and March 29, 2000;
- Review of available site records including but not limited to site permits, drawings, batch logs and reports;
- Review of available aerial photographs, site photographs, historical site plans tax assessment maps, and Sanborn maps;
- Review of Historical Chain-of-Title Searches dated December 21, 1999 and February 2, 2000.
- Interviews with knowledgeable site employees, facility representatives, facility contractors and Township of Carlstadt representatives; and
- Review of groundwater analytical data obtained from monitoring wells installed as part the attached Remedial Investigation Report (RIR).

GARDEN STREET FACILITY PROPERTY (GSFP)

Lot 6 (GSFP)

According to our review of available information, Lot 6 was occupied by a residential dwelling from 1909 until 1987. In 1987, Ganes converted the lot into a paved parking area. Lot 6 is comprised of 10,019 square feet of land space or 0.23 acres and is currently undeveloped and used as a paved parking lot. According to available information, no operations associated with manufacturing have been conducted on Lot 6 and no current or historical AOCs were identified.

Therefore, no further action (NFA) is proposed for Lot 6.

Lot 7 (GSFP)

Information obtained for Lot 7 dates back to pre-1900. The first known structure observed on Lot 7 appeared to be a small shed likely associated with a nearby residential dwelling. In 1946 a residential dwelling was constructed on the lot. In 1966, Ganes purchased the lot and residential dwelling which is still located on the lot to the present day. Lot 7 is comprised of 12,632 square feet of land space or 0.29 acres and is currently and historically has been occupied by a residential dwelling and associated garage. According to available information, no operations associated with manufacturing have been conducted on Lot 7 and no current or historical AOCs were identified.

Therefore, NFA is proposed for Lot 7.

Lot 8 (GSFP)

Information obtained for Lot 8 dates back to pre-1900. The information indicates that Lot 8 was occupied by a residential dwelling from 1909 until 1998. Ganes purchased Lot 8 in 1981. In 1989 Ganes constructed their Quality Control Lab on the northwest corner of the lot. Ganes proceeded to remove the residential dwelling in1998 and convert that portion of the lot to a gravel parking area. Lot 8 is comprised of 9,583 square feet of land space or 0.22 acres and is currently occupied by the Quality Control Lab, a grassed areas, outside cabana eating area and gravel parking area. The

Quality Control Lab has been in operation since 1989 and used for conducting high proficiency liquid chromatography (HPLC), gas chromatography, and wet chemistry using basic solvents (i.e. acetonitrile, 5% tri-ethylamene (TEA), methanol, IPA, and acetic acid). Since its construction, all wastewater generated at the building has been discharged to the Bergen County Utility Authority. The Quality Control Lab also contains office space and basement used for storing office supplies and office equipment.

The following AOC was identified on Lot 8:

AOC - MSA-38 (Quality Control Lab)

Location:	GSFP
Figure:	Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Description:	Appendix E-3
Photograph:	None

Small amounts of laboratory grade chemicals are stored throughout the Quality Control Lab in storage cabinets within close proximity to work locations where the consumables are used. There are approximately 10 hazardous materials storage cabinets in use at the Quality Control Lab.

Ganes proposes NFA for AOC – MSA-38 because:

- The storage cabinets are located in the building interior with no potential for release to the environment;
- The cabinets are located on poured concrete;
- There have been no reported releases to the environment;
- No staining was observed;
- All hazardous materials are stored in containers of 5-gallons or less;
- No manufacturing is currently or has historically been conducted on Lot 8; and
- Sinks and floor drains discharge directly to the Bergen County Utility Authority (BCUA) Little Ferry Treatment Plant, via the Borough of Carlstadt sanitary sewer

collection system.

Lot 9 (GSFP)

Information obtained regarding Lot 9 dates back to pre-1900. The information indicates that the lot was vacant/undeveloped until the 1910's at which time a residential dwelling was constructed. Ganes purchased the lot in 1960 and in 1981 removed/demolished the residential dwelling and constructed their Research and Development (R&D) Center. The R&D Center operated from 1981 until late 1999, at which time operations at the R&D Center were closed. The former R&D Center is currently under construction for conversion to office space for Novus Fine Chemicals, the new owners of Blocks 18 & 19. Lot 9 is comprised of 11,021 square feet of land space or 0.253 acres and is currently occupied by the former R&D Center (4,446 square feet) and a storage shed (historically associated with the former residential dwelling) currently used to store winter snow removal equipment.

The R&D Center was in operation from 1981 until 1999. The R&D Center was used for experimentation, product development and product trouble shooting. A wide variety of chemicals were utilized at the R&D Center since its construction and all wastewater generated at the building has been discharged to the Bergen County Utility Authority. The basement area of the R&D Center consisted of a break room, heater room and rest rooms.

The following AOC was identified on Lot 9:

AOC - MSA-39 (Former R&D Center)

Location:	GSFP
Figure:	Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Description:	Appendix E-3
Photograph:	None

Small amounts of laboratory grade chemicals were stored within the former R&D Center laboratories. The laboratory grade chemicals were stored in cabinets within close proximity to work locations where the consumables were used.

Ganes proposes NFA for AOC – MSA-39 because:

- The storage cabinets were located in the building interior with no potential for release to the environment;
- The cabinets were located on poured concrete;
- There have been no reported releases to the environment;
- No staining was observed;
- All hazardous materials were stored in containers of 5-gallons or less;
- No manufacturing is currently or has historically been conducted on Lot 9; and
- Sinks and floor drains discharge directly to the (BCUA) Little Ferry Treatment Plant, via the Borough of Carlstadt sanitary sewer collection system.

Lot 10 (GSFP)

Lot 10 historically and currently consists of the main manufacturing area of the site. Lot 10 was the first portion of the subject property that was constructed. Original construction began on Lot 10 in the late 1890's by Trubek Chemical Works. The Property was eventually purchased and/or the name changed to Franco American Chemical Company in 1909 and was later purchased by Ganes in 1934. The majority of Lot 10 is currently covered by concrete with the exception of an approximately 20' by 4' area located just east of Room 10. A number of repaired cracks in the concrete were noted throughout Lot 10. Lot 10 is comprises 47,916 square feet of land space or 1.1 acres and primarily consists of the main manufacturing area of the property (15,085 square feet of building improvements). The lot measures approximately 240' by 220'.

Lot 10 can be characterized by the following:

- Currently (prior to purchase of Novus Fine Chemicals, Inc.) contained approximately thirteen manufacturing (MFG) rooms/areas, three laboratory rooms, a boiler house, a maintenance room and several storage rooms;

- Historically maintained 44 underground storage tanks (USTs) within fourteen identified tank areas;
- Currently maintains seven active USTs;
- Historically maintained nine ASTs;
- Currently maintains nine active ASTs; and
- Currently/historically contains sumps, process trenches, drainage swales, floor drains, clean outs, sinks, and vaults.

THE FOLLOWING BULK UNDERGROUND STORAGE TANK AND PROCESS FLOW THROUGH TANK AOCS WERE IDENTIFIED IN LOT 10 OF THE GSFP.

AOC – UTA-1 (Neutralization Tank)

Location: GSFP
Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description: Appendix E-1
Photograph: No. 1

AOC-1 is located outside Rooms 1 and 24 of the GSFP and consists of an active neutralization tank. The neutralization tank is used to collect industrial process, cooling, boiler blow down wastewater and some storm water via the on-site wastewater trenching system. Neutralization is accomplished via pH adjustment. Following pH adjustment, the treated wastewater is gravity feed under Room 1 to the settling tank (AOC – UTA-16) for sampling and ultimate discharge to the BCUA Little Ferry Treatment Plant via the Borough of Carstadt sanitary sewer collection system.

The neutralization tank is a flow through process tank constructed of cedar wood and has been in operation a minimum of 50 years. The estimated size of the cedar tank is 2,000 gallons. There is no documented evidence of integrity testing for this unit. Therefore, if there is a breach in the integrity of the neutralization tank, discharges to the environment are possible.

Ganes proposes investigation activities for AOC – UTA-1.

AOC – UTA-2 (Former UST Area)

Location: GSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-1

Photograph: None

AOC-2 is located inside Room 24 of the GSFP. UTA-2 historically consisted of two 550-gallon USTs that contained alcohol. According to available information the USTs were observed on a 1924 site plan and not on a 1946 site plan. No information pertaining to removal activities, integrity, or construction of the USTs were available for review.

Ganes proposes NFA for AOC – UTA-2 because:

- There was no indication that the tanks remain on-site;
- The tanks were not reported in operations by employees interviewed; and
- Any residual contamination associated with a release from this tank will be identified in the network of on-site groundwater monitoring wells.

AOC – UTA-3 (Former/Current UST-8 Tank Area)

Location: GSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-1

Photograph: No's. 2 & 3

AOC-3 is located outside Room 22 of the GSFP. UTA-3 consists of four former USTs and one current active UST. The first tank was installed prior to 1949 and consisted of a 15,000-gallon fuel oil UST. A second 15,000-gallon No. 6 heating oil UST was installed in 1952 to replace the first tank. A third 10,000-gallon fuel oil tank was installed in 1977 to replace the second tank which was subsequently replaced by a 15,000-gallon fuel oil UST (tank No. 18) in 1981. In 1987, tank No. 18 was replaced by a 15,000-gallon double walled carbon steel No. 6 fuel oil tank (UST Registration No. 0059231) currently active.

The current active UST-8 is constructed of double walled carbon/steel outer and inner shell and single walled carbon steel piping. The tank is equipped with cathodic protection and liquid detection in the tank shells annular space. The tank piping also maintains liquid detection via a piping sump located above the tank. The current active tank and four previous tanks were used to store heating oil use in the on-site boilers located in Room 20. No information pertaining to removal activities or integrity testing of the four former tanks was available for review. Therefore, if there was a breach in the integrity of the former tanks, discharges to the environment were possible. Also, as described in the narrative for AOC – DS-59, an open, unlined sump was installed into the subsurface soils in the basement of Room 17 (see Photograph No. 23). According to site personnel, an oily liquid was observed at the base of the sump approximately 1987. The sump appears to have been expanded into the native soil and a pump was placed inside to collect the oily material into containers for proper disposal off-site. Furthermore, according to site personnel, the oily material was no longer present as of approximately 1990. The oil in the sump could be an indication that a leak from one of the previous tanks had occurred.

Ganes proposes investigation activities for AOC – UTA-3.

<u>AOC – UTA-4 (Former UST Area)</u>

Location:	GSFP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-1
Photograph:	No. 2

AOC-4 is located between Rooms 12 and 22 and just south of the canopy associated with Room 18 of the GSFP. UTA-4 historically consisted of a 1,000-gallon caustic tank last noted in a 1964 historical site plan. No information pertaining to removal activities, integrity testing or construction of the UST was available for review.

Ganes proposes NFA for AOC – UTA-4 because:

- There was no indication that the tank remains on-site;
- The tank is not reported in operations by employees interviewed;
- Ground Penetrating Radar survey conducted in the area of the suspect tank did not reveal the presence of any anomalies; and
- If a release had occurred prior to 1964, the material would have most likely degraded to an equilibrium status.

AOC – UTA-5 Former/Current (UST-9) Tank Area

Location:	GSFP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-1
Photograph:	No. 4

AOC-5 is located outside the northwest side of Room 25 of the GSFP. Records indicate that in 1947 three 550-gallon bare steel USTs (tanks E2, E3, & E4) were installed, one containing benzol (isopropyl acetone) and two containing toluene. These three tanks were reportedly replaced in 1977 with three 500-gallon solvent tanks. The three solvent tanks were reportedly replaced in 1981 with three 550-gallon steel USTs (tanks 10, 11, & 12), one containing MIBK and two containing toluol. Tanks 10, 11, & 12 were replaced in 1989 with a 2,000-gallon, steel, cathodically protected tank and piping (UST-8) containing toluene (UST registration No. 0059231).

No information concerning the integrity of the former tanks was available. However, according to site representatives, during the removal of tanks 10, 11, & 12, impacted soils were observed, excavated and stockpiled on-site (AOC – MSA-28). Post-excavation soil samples were collected which reportedly indicated that soils were impacted. Further, according to site representatives, a report containing post-excavation soil sample results was submitted to the NJDEP. This report was not found during our file review conducted at the NJDEP office in Trenton, New Jersey. The stockpiled soils were also reportedly resampled and found to contain contaminates below the soil cleanup criteria and properly disposed of off-site. As documented in the Remedial Investigation Report attached as Appendix G to this Report, groundwater collected from monitoring wells in the area of the former and current tanks has been impacted with toluene.

UST-8 is filled via a remote fill located on the northwest wall of Room 25, located directly above the tank. Product from the tank is manually pumped into 55-gallon drums and moved to appropriate rooms for use.

Ganes proposes investigation activities for AOC – UTA-5.

AOC – UTA-6 Former/Current (UST-10) Tank Area

Location:	GSFP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-1
Photograph:	No. 5

AOC-6 is located between Rooms 10 and 25 and northwest of Room 9 of the GSFP. Records indicate that four former USTs were maintained from prior to 1949 to 1989 and a current UST has been in service since 1989.

Records indicate that prior to 1949 a 10,000-gallon caustic/benzene tank was installed. Between 1977 and 1981, this tank was replaced with two 5,000-gallon tanks (tank 29) consisting of a benzyl cyanide tank and an acetic anhydride tank. In 1982, a 10,000-gallon acetic anhydride tank (tank E1) replaced tanks 29. A 6,000-gallon, stainless steel cathodically protected acetic anhydride tank (UST-10 registration No. 0059231) was installed in 1989 and replaced tank E1. No information pertaining to removal activities, integrity testing or construction of the former USTs was available for review.

Therefore, if there was a breach in the integrity of the former tanks, discharges to the environment were possible.

Product piping extends two feet up the northwest wall of Room 9 was the active UST-10 is filled. Feeder lines from the tank also extend up and in the northwest wall of Room 9.

Ganes proposes investigation activities for AOC – UTA-6.

<u>AOC – UTA-7 (Former/Current (USTs 5-7) Tank Area)</u>

Location:	GSFP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-1
Photograph:	No's. 6 & 7

AOC-7 is located outside the northwest corner of Room 7 and the canopy of the GSFP. Records indicate that twelve former USTs were maintained in this area since before 1949 to 1986 and currently, three USTs are in service, installed in 1986.

Records indicate that prior to 1949, six 550-gallon solvent tanks were installed and replaced prior to 1964 with three 6,000-gallon tanks containing caustics, methanols, and alcohols. In 1971, three 5,800-gallon tanks (tanks 26, 27, & 28 or E5, E6, & E7) were installed and replaced with three 6,000-gallon tanks. Tank 26 contained caustics, tank 27 contained methanol, and tank 28 contained isopropynol. The tanks were constructed of steel. In 1986, three 6,000-gallon tanks (USTs 5, 6, & 7) were installed and replaced tanks 26, 27, & 28. Tanks 5, 6, & 7 (UST registration No. 0059231) contain ethanol, isopropanol alcohol and sodium hydroxide, respectively. These tanks are currently active and are constructed of double walled steel. No information pertaining to removal activities, integrity testing or construction of the former USTs was available for review. Therefore, if there was a breach in the integrity of the former tanks, discharges to the environment were possible.

Product piping with the exception of a feed line associated with UST-7 extend above ground either to the loading area (AOC – MSA-31) or to manufacturing rooms. Product lines from UST-5 (sodium hydroxide) extend below grade to Room 24 and feed an AST mounted to the inside wall. According to facility records, the product piping is cathodically protected. Locations of product piping associated with the historically operated USTs are unknown.

Ganes proposes investigation activities for AOC-UTA-7.

AOC – UTA-13 (Former UST Area)

Location: GSFP
Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description: Appendix E-1
Photograph: No. 8

AOC-13 is located just outside the northwest side of Room 4 of the GSFP. UTA-13 was observed on the 1924 historical site plan and reportedly consisted of a 200-gallon alcohol tank. Information pertaining to removal activities, integrity testing or construction of the UST was not available for review.

Ganes proposes NFA for AOC – UTA-13 because:

- There was no indication that the tank remains on-site;
- The tank is not reported in operations by employees interviewed; and
- Any residual contamination associated with a release from this tank will be identified in the network of on-site groundwater monitoring wells.

AOC – UTA-16 (Settling Tank)

Location: GSFP
Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description: Appendix E-1

Photograph: No. 9

AOC-16 is located outside southwest of Room 2, between Rooms 2 and 20 of the GSFP. UTA-16 historically and currently consists of a flow through process settling tank constructed of a fiberglass-lined vault. The settling tank is used to settle out particles in the treated industrial process wastewater following treatment in the neutralization tank (AOC – UTA-1). Following sampling in accordance with the facilities Industrial Wastewater Discharge Permit No. 99-0287, the treated wastewater is ultimately discharged to the BCUA Little Ferry Treatment Plant via Outfall 001. Information pertaining to size and integrity testing of the settling tank was not available for review.

As documented in Appendix H-1 Summary of Enforcement Actions, due to operations, Ganes has failed to meet discharge requirements for toluene on numerous occasions that indicates, if there is a breach in the integrity of the settling tank, discharges to the environment are likely. Also, according to site records and employee interviews, during routine inspection in July of 1997, Ganes noticed a crack in the fiberglass settling tank which is located in a concrete sump. The initial decision was made to replace the fiberglass tank. Flow from the neutralization tank (AOC – UTA-1) was diverted from the settling tank to an emergency bypass line to the diversion pit (AOC – UTA-18). A new fiberglass liner was installed.

Ganes proposes investigation activities for AOC – UTA-16.

<u>AOC – UTA-17 (Former UST Area)</u>

Location: GSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-1

Photograph: None

AOC-17 is located outside the southwest wall of the distilling room of the former Franco-American facility (currently inside Rooms 3 & 4) of the GSFP. UTA-17 consisted of two (HS and LB) tanks of unknown size and content that were observed on the 1924 historical site plan. Information pertaining to size, location, removal activities and integrity of the USTs was not available for review.

Ganes proposes NFA for AOC – UTA-17 because:

- There was no indication that the tanks remain on-site;
- The tanks are not reported in operations by employees interviewed; and
- Any residual contamination associated with a release from these tanks will be identified in the network of on-site groundwater monitoring wells.

<u>AOC – UTA-18 (Diversion Pit)</u>

Location:	GSFP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-1
Photograph:	No's. 10 & 11

AOC-18 is located underneath the canopy northwest of Room 7 of the GSFP. UTA-18 currently consists of a fiberglass-lined vault (diversion pit) of unknown size. According to site personnel, the vault historically contained an underground storage tank. The contents of the tank are unknown. The tank was removed (unknown) and the vault was then lined with fiberglass approximately two years ago. The fiberglass-lined concrete vault is currently used to store overflow wastewater from the neutralization tank (AOC – UTA-1) during periods of high flow. Additional information pertaining to size, location, removal activities and integrity testing of the former UST and vault were not available for review. Therefore, if there is a breach in the integrity of the diversion pit vault, discharges to the environment were likely.

Ganes proposes investigation activities for AOC – UTA-18.

THE FOLLOWING BULK ABOVEGROUND STORAGE TANK AOCS WERE IDENTIFIED IN LOT 10 OF THE GSFP.

AOC – ATA-19 (Acid Transfer Tank 1)

Location: GSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-2

Photograph: No's. 2 & 12

AOC-19 is located outside southwest side of Room 22 of the GSFP. ATA-19 consists of two-former, and one currently active AST. Records indicate that the first tank, a 1,200-gallon sulfuric acid tank was installed prior to 1946 and removed prior to 1977. Records also indicate that an additional acid tank was installed in the same location during the same time frame. It is possible that the same tank is noted twice. Currently, an approximately 160-gallon acid transfer tank 1 is located mounted to the exterior wall of Room 22 in this area. The sulfuric acid transfer tank 1 is filled via overhead pressurized feed lines from AST-15 (AOC – ATA-21) located approximately twenty feet south of the acid transfer tank 1.

Ganes proposes NFA for AOC – ATA-19 because:

- Areas surrounding the tank are concrete;
- No staining was observed in the area;
- There have been no reported spills or releases associated with ATA-19; and
- ATA 19 is located on the exterior wall of Room 22 and any spills or releases from this tank will be investigated along with AOC – DS-66, which includes storm drains in the area of the subject AST.

AOC – ATA-20 (AST- 35)

Location: GSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-2

Photograph: No's. 2 & 3

AOC-20 is located near the canopy southeast of Room 22 of the GSFP. ATA-20 consists of an active, fiberglass-constructed 6,000-gallon AST (AST-35) containing propylene glycol. The tank is directly filled and feed lines extending from the tank are all aboveground.

Ganes proposes NFA for AOC – ATA-20 because:

- Fuel deliveries occur on a concrete apron;
- Areas surrounding the tank are concrete;
- No staining associated with spills or releases were observed in the area;
- There have been no reported releases to the environment from ATA-20; and,
- If a spill or release had occurred, the release would be directed to the storm water collection system (AOC – DS-73) located northwest of the tank. Investigations are proposed for storm water collection system (AOC – DS-73).

AOC – ATA-21 (Former/Current (ASTs 15, 25, 13, P-6) Tank Area)

Location: GSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-2

Photograph: No's. 6 & 13

AOC-21 is located west of Room 33 of the GSFP. ATA-21 consists of seven-former, and four active ASTs identified as the AST tank farm. Three of the active 4,000-gallon tanks, No. 15, 25, 13, contain xylene, sulfuric acid, and acetic acid, respectively. The fourth, a 6,000-gallon tank (P-6) contains an alcohol, water and salt mixture. The tanks are all maintained within secondary containment capable of containing releases from the tanks.

Product lines associated with the ASTs extend above ground to the manifold loading area (AOC – MSA-31). Feed lines also associated with the ASTs extend aboveground to associated transfer and drop tanks located throughout the GSFP. No staining or spills were observed from the ASTs or associated lines.

Ganes proposes NFA for AOC – ATA-21 because:

- The tanks are located within secondary containment;
- The integrity of the secondary containment is good;
- Product deliveries occur on a concrete apron;
- No staining associated with spills or releases were observed in the area;
- All product and feed lines associated with the ASTs appeared to be in good condition and no signs of breaches within the lines were observed;
- There have been no reported releases to the environment from the tanks located in ATA-21; and
- If a release had occurred, the area is located adjacent to UTA-7, which will be investigated.

AOC – ATA-22 (Acid Drop Tank 2 and Tank P-5)

Location:	GSFP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-2
Photograph:	No's. 8 & 14

AOC-22 is located outside the west wall of Room 4 of the GSFP. ATA-22 consists of an active approximately 160-gallon acid drop tank (#) 2 mounted approximately ten feet up the outside wall of Room 4. A second out-of-service 500-gallon acid tank (tank P-5) is also located at ground surface on a concrete pad. Piping associated with the two tanks extend above ground to rooms 2, 3, 4, & 5.

Ganes proposes NFA for AOC – ATA-22 because:

- Product deliveries occur on a concrete apron;
- Areas surrounding the tanks are concrete;
- No staining associated with spills or releases were observed in the area;
- There have been no reported releases to the environment from the tanks located in ATA-22; and
- If a spill or release had occurred, the release would be directed to the storm water collection system (AOC – DS-66) located north of the tank. Investigations are proposed for the storm water collection system (AOC – DS-66).

AOC – ATA-23 (Acid Neutralization Tank and Acid Drop Tank 1)

Location:	GSFP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-2
Photograph:	No's. 1 & 15

AOC-23 is located outside the south wall of Room 1 between Rooms 24 and 3 of the GSFP. ATA-23 consists of an approximately 160-gallon acid drop tank 1 which is mounted approximately 10 feet up the south wall of Room 1 and a 2,000-gallon acid neutralization tank (sulfuric acid) mounted on a steel platform approximately three feet above the neutralization tank (AOC – UTA-1).

The acid drop tank 1 is used to provide acid for manufacturing conducted in Room 1. Piping associated with this tank extends above ground into Room 1. The acid neutralization tank is located just off the eastern side of the neutralization tank and is used to treat (pH neutralization) wastewater on-site. Piping associated with the acid neutralization tank extends from the base of the tank into the neutralization tank. Feed lines from the acid neutralization tank extend from the top of the tank aboveground to AST-25 (AOC – ATA-21).

Ganes Proposes NFA for AOC – ATA-23 because:

- Areas surrounding the tank are concrete;
- No staining associated with spill or releases were observed in the area;
- There have been no reported spills or releases associated with ATA-23; and
- ATA-23 is located within close proximity to the neutralization tank (AOC-1) and a spill or release from these tanks will be identified during the course of the AOC-1 investigation.

<u>AOC – ATA-24 (Former ASTs)</u>

Location: GSFP
Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description: Appendix E-2
Photograph: None

AOC-24 is located along the outside eastern wall of Room 21 of the GSFP. ATA-24 consists of two former 500-gallon steel tanks containing ethanol and monomethanaline. The tanks were reportedly removed less than five years ago. No additional information was obtained regarding ATA-24.

Ganes proposes NFA for AOC – ATA-24 because:

- Product deliveries occurred on a concrete apron;
- Areas surrounding the tanks are concrete;
- No staining associated with spill or releases were observed in the area;
- There have been no reported releases to the environment from the tanks located in ATA-24; and
- If a spill or release had occurred, the release would be directed to the storm water collection system (AOC – DS-67) located northwest of the former tanks. Investigations are proposed for the storm water collection system (AOC – DS-67).

THE FOLLOWING MATERIAL STORAGE AOCS WERE IDENTIFIED IN LOT 10 OF THE GSFP.

AOC - MSA-29 (Basement Room 17)

Location: GSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-29 is located in the basement of Room 17 of the GSFP. The area was identified as a hazardous materials storage area in the 1949 and 1964 historical site plans. Material storage included light machinery, machine oil, dimethyl urea and empty containers. The floor of the basement is constructed of concrete and contains closed floor drains and trenches (AOC – DS-59). Small amounts (less than 5-gallons) of hazardous materials are currently stored in the basement. Small areas (less than 2 sq/ft) of staining were observed and any larger and older spill would have been contained by the floor trenching system.

Ganes proposes NFA for AOC – MSA-29 because:

- Any spill or releases from MSA-29 would have been contained by the trenching system that will be assessed as part of AOC DS-59.

AOC - MSA-30 (Hazardous Waste Drum Storage Pad)

Location: GSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: No's. 2, 3 & 16

AOC-30 is a hazardous waste drum storage pad located outside east of Room 22 and above UST-8 (AOC – ATA-20) of the GSFP. The hazardous waste drum storage pad has a capacity to store 100

55-gallon drums or a total of 5,500-gallons. The storage pad is uncovered and constructed of concrete pad that is sloped to floor drains/trenchs on the western side of the pad (AOC – DS-73). Floor drains ultimately discharge to the neutralization tank (AOC – UTA-1).

Ganes proposes NFA for AOC – MSA-30 because:

- The area around MSA-30 is constructed of concrete;
- No spill or releases were reported;
- No staining was observed associated with spills or releases; and
- Any spills or releases from the hazardous waste storage pad would be directed to a trench and sump that will be investigated as part of AOC – DS-73.

AOC - MSA-31 (Loading/Unloading Area)

Location:	GSFP
Figure:	Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Description:	Appendix E-3
Photograph:	No's. 2, 3, 4 & 17

AOC-31 is a loading and unloading area located in the GSFP. The facility maintains a UST manifold system along the eastern wall of Room 33. The manifold is utilized to fill and vent USTs 5, 6, and 7 (AOC – UTA-7), UST-10 (AOC – UTA-6) and ASTs 13, 15, and 25 (AOC – ATA-21). MSA-31 also includes the removal for off-site disposal of hazardous waste from MSA-30, drum storage pad. During loading and unloading of hazardous materials, a valve located in the trenching system (AOC – DS-74) at the location of UST-8 is shut in an effort to divert any spilled or released material to the sump located between Room 33 and the AST tank farm. If a spill occurs, the material will be contained in the sump and pumped into the AST tank farm secondary-containment system. According to site personnel, a spill or release has never occurred.

Ganes proposes NFA for AOC – MSA-31 because:

- All product piping is located above ground;

- The area around MSA-31 is constructed of concrete;
- No spill or releases were reported;
- No staining was observed associated with spills or releases; and
- Any spills or releases from the loading/unloading area would be directed to a trench and sump that will be investigated as part of AOC – DS-74.

AOC - MSA-32 (Room 33)

Location:	GSFP
Figure:	Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Description:	Appendix E-3
Photograph:	None

AOC-32 was identified as a historic hazardous material storage area located in Room 33 of the GSFP. The area was identified as a hazardous materials storage area in the 1949 and 1964 historical site plans. Material storage included manufacturing process chemicals. The floor of Room 33 is constructed of concrete with floor drains (AOC – DS-65) along the east and west interior walls. These drains discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-32 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The room is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release;
- Any spill or releases from MSA-32 would have been contained by the trenching system that will be assessed as part of AOC DS-65; and
- Any residual contamination associated with a release from this tank will be identified in the network of on-site groundwater monitoring wells.

AOC - MSA-33 (Former Cyanide Building)

Location: GSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-33 was identified as a historic hazardous material storage area on the 1946 historical site plan. Hazardous material storage included a cyanide (building/shed/ice house) located west of Room 33 and above the current AOC – ATA-21 area of the GSFP. The area was identified as a hazardous materials storage area between 1946 and 1977. It is no longer used as a hazardous material storage area. However, there is no information available to determine if storage of materials in the former cyanide building resulting in released materials.

Ganes proposes investigation activities for AOC – MSA-33.

AOC - MSA-34 (Raw Material Storage Area)

Location: GSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: No's. 6, 8, & 18

AOC-34 is identified as the GSF courtyard raw and in-process materials storage area, which is located outside of Rooms 7 and 5 and over UTA-7. The material storage area is used to store 330-gallon totes and 55-gallon steel and plastic drums containing raw materials for processing. The storage area is uncovered and is constructed of concrete. The concrete slopes to the northwest to a drainage swale and storm drain (AOC – DS-66) for ultimately discharges to the neutralization tank (AOC – UTA-1).

Ganes proposes NFA for AOC – MSA-34 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The storage pad is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release;
- All hazardous materials are stored in 55-gallon steel drums and totes; and
- Any spills or releases from the material storage area would be directed to a drainage swale on the northwestern side of the storage area, which will be investigated as AOC – DS-66.

AOC - MSA-35 (Former Storage Area)

Location:	GSFP
Figure:	Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Description:	Appendix E-3
Photograph:	None

AOC-35 was identified as a historic hazardous material storage area located under the canopied area of the south side of Room 33 of the GSFP. The area was identified on the 1946 and 1949 historical site plans. Materials stored in the area included, hydrochloric acid in carboys. The area is not currently used as a material storage area. The vicinity of AOC-35 appeared to be historically and is currently covered by concrete.

Ganes proposes NFA for AOC – MSA-35 because:

- It appears the area has not been used to store materials since at least 1964;
- No indication of spills or releases were observed; and
- If a release had occurred prior to 1964, the material would have most likely degraded to an equilibrium status.

AOC - MSA-36 (Former Storage Room 11)

Location: GSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-36 was identified as a historic hazardous material storage area located in Room 11 (former pilot plant) of the GSFP. The area was identified as a hazardous materials storage area for the storage of metallic sodium in 55-gallon drums. Material storage in this area was only noted in the 1946 historical site plan. The floor of Room 11 is constructed of concrete and historically maintained floor trenching and sumps that discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-36 because:

- Any spill or releases from MSA-36 would have been contained by the trenching system that will be assessed as part of AOC DS-58; and
- Any residual contamination associated with a release from this material storage area will be identified in the network of on-site groundwater monitoring wells.

AOC - MSA-37 (Room 22)

Location: GSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: No. 19

AOC-37 is located in Room 22 of the GSFP. Room 22 is currently and has historically been utilized to house utility equipment, compressors and compressor blowdowns. The area was identified as a hazardous material storage area for the storage of up to two (2) 55-gallon drums of machine oil. The floor of Room 22 is constructed of concrete and contains closed floor drains along the west wall that discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-37 because:

- Any spill or releases from MSA-37 would have been contained by the drainage system process trenching that will be assessed as part of AOC DS-63.

THE FOLLOWING DRAINAGE SYSTEM AOCS WERE IDENTIFIED IN LOT 10 OF THE GSFP.

Numerous drainage system process trenches including open and closed process trenches, sumps, clean-outs, storm drains, swales and wet vault AOCs were identified in Lot 10 of the GSFP. The trenching may be operational or closed (i.e., concrete filled) as indicated on the AOCs – Drainage Systems Site Figure attached as Appendix J-3 (Sheet 4 of 4) and the Drainage Systems Description Table provided as Appendix E-4. Photograph No's. 3, 4, 10, 11, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 are provided to illustrate typical floor drain systems.

As indicated on the drawing, most process area trenches are discrete to a given processing room. Very few trenches are interconnected between processing rooms, except where they tie into the chemical sewer or storm sewer for treatment prior to discharge. For wet processing areas, a concrete or terra cotta trench typically runs along one, two, or more walls and conveys water to the wastewater neutralization tank (AOC – UTA-1) for treatment prior to discharge.

As identified on the Drainage Systems Site Figure, AOCs have been divided into room or process AOCs for each room and the outside area where concerns are located. Historically, trenches may have been upgraded or refurbished however documentation or testing of subsurface materials was not completed. Some trenches or sumps have been filled with concrete and abandoned in place. Others have been replaced with new concrete or new terra cotta piping. However, without documentation of subsurface material testing or site observations during closure or upgrade, the possibility for releases exist even beneath the closed trenches.

Similarly, sumps are typically constructed of concrete linings or may have been closed in place. One sump in particular, however, is an open unlined sump installed into the subsurface. This sump is located in the basement of Room 17. It is covered only with a steel plate (see Photograph No. 23). According to site personnel, an oily liquid was observed at the base of the sump approximately 1987. The sump appears to have been expanded into the native soil and a pump was placed inside to collect the material into containers for proper disposal off-site. Furthermore, according to site personnel, the oily material was no longer present as of approximately 1990. The oily sump has been identified as AOC DS-59.

Due to the vast trenching system utilized at the property, building interior AOCs have been included along with the drainage system AOCs. This because each room, as outlined in Appendix E-5 has multiple process tanks, vessels, centrifugal pumps, and above ground process piping which contain hazardous materials and have the ability to discharge hazardous materials into the trenching systems located in each room.

The majority of the floor drain systems were in fair condition and some rooms were noted to have severely corroded systems. The majority of the exterior drainage systems were observed to be in good condition with little corrosion or deterioration. However, it was not possible to determine the integrity of the joints located approximately every two feet within the trenching systems.

> ***Therefore, based on the lack of information regarding the closure, integrity or upgrade of all existing and former trenches and sumps, they have been designated as AOCs - DS-48 through DS-74 and investigation activities are proposed.***

A description of each discharge system designated by AOC number and room ID is provided below.

<u>AOC - DS-48 (Room 1)</u>

Location:	GSFP
Figure:	Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description:	Appendix E-4

Photographs: No's. 20 & 21

Room 1 is currently under construction for conversion to a raw material storage area. Historically Room 1 has been utilized as a manufacturing room. Industrial process wastewater from manufacturing operations was conveyed through open terra-cotta and concrete trenches via gravity feed to an exit point at the southwest corner of Room 1 for direct discharge to the neutralization tank. Approximately 85 linear feet (l.f.) of trenching and one sump (recently removed ~50-gallons) are located in Room 1. An inspection of the sump following removal activates during renovation of Room 1 revealed several holes in the sumps steel liner.

Ganes proposes Investigation Activities for AOC – DS-48.

AOC - DS-49 (Room 2)

Location: GSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4
Photographs: None

Room 2 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to the most southeastern corner of the room where it discharges to Room 3 ultimately for direct discharge to the neutralization tank. A section of trenching and a sump are located in a below grade section at the north end of Room 2. A sump pump conveys the industrial process wastewater up to the trenching at ground level for discharge to Room 3 and ultimate discharge to the neutralization tank. Approximately 1,350 l.f. of terra-cotta and concrete trenching and two concrete sumps are located in Room 2. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-49.

AOC - DS-50 (Room 3)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 3 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to the neutralization tank. Room 3 also acts as the feeder room for Rooms 2, 4, 5, & 6 for direct discharge to the neutralization tank. Approximately 20 l.f. of terra-cotta and concrete trenching and a sump (vault) are located in Room 3. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-50.

AOC - DS-51 (Room 4)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 4 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to Room 3 where it is ultimately discharged to the neutralization tank. Room 4 also acts as the feeder room for Room 5. Approximately 91 l.f. of terra-cotta and concrete trenching and a closed sump are located in Room 4. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-51.

AOC - DS-52 (Room 5)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 5 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed through Room 4 to Room 3 were it is ultimately discharged to the neutralization tank. Room 5 also acts as the feeder room for Room 6. Toluene laden industrial process wastewater from Room 5 is distilled prior to discharging to the trenching system and then to Room 4. Room 5 also is the location of distilling for MIBK impacted wastewater from Rooms 26 and 33. Approximately 78 l.f. of active and 38 l.f. of closed terra-cotta and concrete trenching are located in Room 5. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-52.

AOC - DS-53 (Room 6)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 6 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed through Rooms 3, 4, & 5 ultimately discharging to the neutralization tank. Approximately 78 l.f. of terra-cotta and concrete trenching are located in Room 6. The floor and trenching system within Room 6 has been renovated and painted. No areas of corrosion and deterioration were observed within the upgraded trenching system.

Ganes proposes Investigation Activities for AOC – DS-53.

<u>**AOC - DS-54 (Room 7)**</u>

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 7 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the north side of the room and ties into the main discharge line (AOC – DS-70) ultimately discharging to the neutralization tank. Approximately 110 l.f. of terra-cotta and concrete trenching are located in Room 7. The floor and trenching system within Room 7 has been renovated and painted. No areas of corrosion and deterioration were observed within the upgraded trenching system.

Ganes proposes Investigation Activities for AOC – DS-54.

<u>**AOC - DS-55 (Room 8)**</u>

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 8 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the north side of the room and ties into the main discharge line (AOC – DS-70) ultimately discharging to the neutralization tank. Approximately 140 l.f. of terra-cotta and concrete trenching are located in Room 8. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-55.

AOC - DS-56 (Room 9)

Location:	GSFP
Figure:	Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description:	Appendix E-4
Photographs:	No's. 25 through 28

Room 9 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the north side of the room and ties into the main discharge line (AOC – DS-70) ultimately discharging to the neutralization tank. Toluene laden industrial process wastewater from Room 9 is treated (distilled) prior to discharging. Approximately 140 l.f. of terra-cotta and concrete trenching are located in Room 9. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-56.

AOC - DS-57 (Room 10)

Location:	GSFP
Figure:	Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description:	Appendix E-4
Photographs:	None

Room 10 has historically been utilized as a repair/maintenance and plumbing shop. Room 10 currently maintains a closed floor drain and active sink. According to available information, the sink currently drains through an underground line that is connected to Room 11 ultimately discharging to Outfall 003.

Ganes proposes Investigation Activities for AOC – DS-57.

AOC - DS-58 (Room 11)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: No. 22

Room 11 has historically been utilized as a chemical storage area, laboratory and pilot plant. The room maintains two closed floor drains and a closed sump.

Ganes proposes Investigation Activities for AOC – DS-58.

AOC - DS-59 (Room 17 Basement)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: No. 23

Room 17 is comprised of a ground floor and basement. The ground floor has historically been utilized for manufacturing and the basement for storage of equipment and chemicals. The ground floor maintains a wastewater trenching system that is divided down the center of the room for discharging. The eastern side of the room discharges to the wastewater sump between Rooms 20 and 17 (AOC – DS-72) and the west side discharges to the sump located just outside the eastern wall of Room 17 (AOC – DS-71). A closed trenching system and associated floor drain are located in the basement. Also located in the basement is an open unlined sump installed into the subsurface soils and covered with a steel plate (see Photograph No. 23). According to site personnel, an oily liquid was observed at the base of the sump approximately 1987. The sump appears to have been expanded into the native soil and a pump was placed inside to collect the material into containers for proper disposal off-site. Furthermore, according to site personnel, the oily material was no longer present as of 1990.

Ganes proposes Investigation Activities for AOC – DS-58 Basement Trenching System.

- Any breaches of integrity in the ground floor trenching system would release materials to the basement area of Room 17. Therefore, Ganes only proposes to conduct investigation activities associated with the drainage system in the basement area of Room 17.

AOC - DS-60 (Room 18)

Location:	GSFP
Figure:	Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description:	Appendix E-4
Photographs:	None

Room 18 has historically been utilized as a storage area. The room maintains two closed floor drains.

Ganes proposes Investigation Activities for AOC – DS-60.

AOC - DS-61 (Room 20)

Location:	GSFP
Figure:	Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description:	Appendix E-4
Photographs:	None, see typical trenching systems photograph No's. 25 through 29

Room 20 has historically been utilized as a manufacturing room and is also the boiler house. Two boilers are located on the eastern half of the room and manufacturing is conducted on the western half of the room. Industrial process and boiler blow down wastewater are conveyed through open terra-cotta and concrete trenches via gravity feed to where it exits the northwest wall of Room 20 and discharges to a wastewater sump located between Rooms 17 and 20 (AOC – DS-72). The wastewater is pumped from the sump via an overhead line to the neutralization tank. Approximately 77 l.f. of active and 35 l.f. of closed terra-cotta and concrete trenching are located in Room 20. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-61.

AOC - DS-62 (Room 21)

Location: GSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4
Photographs: See photograph No. 19 as typical utility room (Room 22).

Room 21 has historically been utilized as a utility room containing compressors and equipment. Compressor blow down wastewater is conveyed to a floor drain located in the center of the room. It is unclear as to the discharge point of the floor trench, however according to site personnel, the floor drain discharges to Room 20 and ultimately to the wastewater sump located between Rooms 17 and 20 (AOC –DS-72). The wastewater is pumped from the sump via an overhead line to the neutralization tank.

Ganes proposes Investigation Activities for AOC – DS-62.

AOC - DS-63 (Room 22)

Location: GSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4
Photographs: No. 19

Room 22 has historically been utilized as a utility room containing compressors and equipment.

Compressor blow down wastewater historically was conveyed to a floor drain and associate trenches located at the northern end of the room which have since been abandoned in place. Approximately 22 l.f. of closed trenching is located in Room 22.

Ganes proposes Investigation Activities for AOC – DS-63.

<u>AOC - DS-64 (Room 24)</u>

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 24 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the west side of the room and ties directly into the neutralization tank. Approximately 75 l.f. of terra-cotta and concrete trenching are located in Room 24. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-64.

<u>AOC - DS-65 (Room 33)</u>

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None, see typical trenching systems photograph No's. 25 through 29

Room 33 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed where it exits the south side of the room and ties into the main discharge line for ultimate discharge to the neutralization tank. Approximately 72 l.f. of terra-cotta and concrete trenching and two floor drains are located in Room 33. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-65.

<u>AOC - DS-66 (Rooms 1, 24, & 4 Outside Area)</u>

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None

The facility maintains a drainage swale that extends northwest of AST 15 (AST tank farm) to outside Room 4 where storm water drains into two storm drains. The storm swale extends approximately 60 feet before entering the storm drains. The storm swale appeared to be in good condition with some corrosion. Access to the storm drains was not possible. Storm water is reported to enter the wastewater neutralization tank for treatment prior to discharge to the sanitary sewer system.

Ganes proposes Investigation Activities for AOC – DS-66 Associated with the Storm Drains.

- The concrete swale appeared in good condition, no breaches in integrity were observed. Some areas of corrosion were observed.

<u>AOC - DS-67 (Rooms 2, 20, 21, & Canopy, Outside Area)</u>

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: No. 9

The facility maintains a drainage swale that extends from outside Room 20 down along Room 21 to three storm drains located within the area of the sedimentation tank. The storm swale extends approximately 32 feet before entering the storm drains. The storm swale appeared to be in good condition. Access to the storm drains was not possible. Storm water is reported to enter the sedimentation tank from the storm drains.

Ganes proposes Investigation Activities for AOC – DS-67 Associated with the Storm Drains.

- The concrete swale appeared in good condition, no breaches in integrity were observed.

AOC - DS-68 (Rooms 6, 7, & Canopy Outside Area)

Location: GSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4
Photographs: No. 8

The facility maintains a drainage swale that extends from the entrance gate along Orchard Street to the southwest corner of Room 7 where it ties into a gutter inlet from the roof of Room 7. The storm swale extends approximately 32 feet before entering extending below grade and reportedly tieing into the process wastewater line associated with (AOC – DS-70) ultimately for discharge to the neutralization tank. The storm swale appeared to be in good condition.

Ganes proposes NFA for AOC – DS-68 because:

- No spill or releases were reported in the area of the storm swale;
- No staining was observed associated with spills or releases; and
- The process wastewater discharge line associated with AOC – DS-70 will be further investigated.

AOC - DS-69 (Rooms 7, Canopy Area, & Diversion Pit Outside Area)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: No. 10

AOC – DS-69 has also been identified as AOC - UTA-18 and is located underneath the canopy northwest of Room 7 of the GSFP. UTA-18 currently consists of a fiberglass-lined vault (diversion pit) estimated at ~10,000-gallons. According to site personnel, the vault historically contained an underground storage tank. The historical content of the tank is unknown. The tank was removed (unknown date) and the vault was then lined with fiberglass approximately 2 years ago. The fiberglass-lined vault is currently used to divert wastewater from the neutralization tank (AOC – UTA-1) during a spill. Additional information pertaining to size, location, removal activities and integrity testing of the UST/Pit was not available for review.

Ganes proposes NFA for AOC – DS-69 because:

- The AOC will be accessed as part of AOC – UTA-18.

AOC - DS-70 (Rooms 7, 8, & 9 Outside Area)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None

Room 7, 8, 9 & 33 discharge industrial process wastewater via gravity feed through process trenching systems that exit each room through the north wall and Room 33 exits through the south wall. Each room ties into an underground process trench that begins at Room 9 and runs along the outside the north end of rooms 7 and 8 and the rear (south) of room 33 to outside of Room 5 where it turns to the neutralization tank for ultimate discharge.

Ganes proposes Investigation Activities for AOC – DS-70.

AOC - DS-71 (Outside Area West of Room 17)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None

DS-71 consists of a 37 linear feet cooling water open drainage swale that discharges to an approximate 250-gallon sump. Process wastewater is also discharged into the sump from the eastern half of the ground floor of Room 17. The wastewater is pumped from the sump via overhead lines to the neutralization tank for treatment. The sumps construction consists of a fiberglass liner mounted in concrete which appeared to be in good condition. Also, the swale is constructed of concrete and appeared to be in good condition.

Ganes proposes Investigation Activities for AOC – DS-71.

AOC - DS-72 (Outside Between Rooms 17 & 20)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: No. 24

DS-72 consists of an approximate 250-gallon sump, storm inlet and trench. Process and boiler blow down wastewater from Room 20 and the western half of Room 17 discharge into the sump. Also, storm water from DS-74 discharges into the sump. The wastewater and storm water is pumped from the sump via overhead lines to the neutralization tank for treatment. The sump was recently replaced (1997) during routine upgrades conducted at the facility. The sump was replaced with a fiberglass liner set in a concrete vault. Documentation of removal and replacement activities was not available for review and according to site personnel, no confirmatory sampling was conducted.

Ganes proposes Investigation Activities for AOC – DS-72.

AOC - DS-73 (Room 22, UST-8 & Hazardous Waste Storage Pad Outside Area)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: None

DS-73 consists of an 8 linear foot open grate storm water trench and sump. The sump is located in the center of the length of trenching. A sump pump conveys the storm water to a storm water inlet between Rooms 17 and 20 (AOC DS-72). The trenching system and sump appeared to be in good condition with some corrosion and deterioration.

Ganes proposes Investigation Activities for AOC – DS-72.

AOC - DS-74 (Room 33 & Loading/Unloading Outside Area)

Location: GSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photographs: No's. 2, 3, and 4

DS-74 consists of a 96 linear foot open grate storm water trench and approximate 50-gallon sump located outside the northwest corner of Room 33. During normal operations, the storm water trench drains storm water to the sump located between Rooms 17 and 20 (DS-72). However, during loading/unloading of hazardous materials associated with (AOC – MSA-30 & 31), a valve located east or UST-8 is closed in case of a spill or release occurs during loading/unloading. If a spill or release occurs, the hazardous material is directed to the sump located outside the northwest corner of Room 33. A sump pump conveys the hazardous waste into the AST tank farm secondary containment area. According to site personnel the facility has never had a release or spill during loading/unloading of hazardous materials.

Ganes proposes NFA for AOC – DS-74 because:

- The trenching system and sump have only contained storm water;
- Historically, no spills or released have occurred in the area which could have caused a release to the environment from within the trenching system or sump; and
- The trenching system and sump appeared in good condition with no cracks, corrosion or deterioration noted.

THE FOLLOWING OTHER AOCS WERE IDENTIFIED IN LOT 10 OF THE GSFP.

AOC-84 (Transformer)

Location: GSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-5

Photograph: None

AOC-84 are transformers located in the basement of Room 3 of the GSFP. The room is currently and has historically been utilized to house the transformers. The transformers are owned and operated by PSE&G. Access to the room was not provided during the site visits.

Ganes proposes NFA for AOC–84 because:

- The transformers are owned and operated by PSE&G.

BUILDING INTERIOR DESCRIPTION FOR LOT 10 OF THE GSFP.

As documented in Appendix E-5, the GSFP maintain within the manufacturing rooms numerous process kettles, centrifuge condensers, drop tanks, pressure filters, shakers, marmites, and vacuum blenders. Each manufacturing room maintains process floor trenching. Any spill or releases from the process equipment and associated product lines would be contained within the trenching systems and are assessed as Drainage System Areas. Also, any residual contamination associated with a release from the drainage systems will be identified in the network of on-site groundwater monitoring wells.

ORCHARD STREET FACILITY PROPERTY (OSFP)

The Orchard Street Facility Property is comprised of Block 19, Lots 9 through 11 and consists of manufacturing, storage areas and residential structures. The Site Plan (Sheet 1 of 4) identifying each lot and block is provided attached under the "Figures" section of the document. A description of each lot is provided below:

Lot 9 (OSFP)

Information obtained for Lot 9 dates back to pre-1900. This information indicates that Lot 9 was vacant/undeveloped until the early 1920's at which time a residential dwelling was constructed. In 1967, Ganes Chemicals purchased the lot and associated residential dwelling which still present on the lot at the present time. Lot 9 is comprised of 5,009 square feet of land space or 0.11 acres and is currently and historically has been occupied by a residential dwelling and associated storage/parking garage. According to available information, no operations associated with manufacturing have been conducted on Lot 9 and no AOCs were identified.

Therefore, NFA is proposed for Lot 9.

Lot 11 (OSFP)

Information obtained for Lot 11 dates back to pre-1900. The first known structure observed on Lot 11 appeared to be a small shed likely associated with a nearby residential dwelling. In 1946 a residential dwelling was constructed on the lot. In 1987, Ganes Chemicals purchase the lot and associated residential dwelling which is still located on the lot at the present time. Lot 11 is comprised of 3,006 square feet of land space or 0.07 acres and is currently and historically has been occupied by a residential dwelling and associated garage. According to available information, no operations associated with manufacturing have been conducted on Lot 11 and no AOCs were identified.

Therefore, NFA is proposed for Lot 11.

Lot 10 (OSFP)

Lot 10 measures approximately 130' by 130' and historically and currently consists of the main manufacturing area. Lot 10 was the second portion of the subject site to be constructed for manufacturing purposes. According to the information, Lot 10 was vacant/undeveloped land until the early 1920's. In 1922, a single structure was located on the lot associated with the Franco American Works. Ganes purchases the lot in 1940 and Rooms 26, 27, and 28 were constructed between 1940 and 1946 and Rooms 29 through 32 between 1946 and 1949. The majority of Lot 10 is currently covered by concrete with the exception of a grassed area located on the southwestern portion of the lot that measures approximately 40' by 70'. Lot 10 comprises 20,952 square feet of land space or 0.48 acres and primarily consists of the secondary manufacturing area of the site encompassing 30,871 square feet of building improvements.

Lot 10 can be characterized by the following:

- Currently contains four manufacturing (MFG) rooms/areas, three material storage rooms, and an office area.
- Historically maintained six underground storage tanks within four tank areas;
- Currently maintains one active UST; and
- Currently/historically maintained sumps, process trenches, drainage swales, floor drains, clean outs, sinks, and vaults.

THE FOLLOWING BULK UNDERGROUND STORAGE TANK AOCS WERE IDENTIFIED IN LOT 10 OF THE OSFP.

AOC – UTA-8 (Former UST Area)

Location: OSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-1

Photograph: None

AOC–8 is located between Rooms 26 and 27 of the OSFP. Records indicated that a UST was installed prior to 1924 as noted on the Franco-American Works 1924 historical site plan. Information pertaining to tank size, content, construction, removal activities or integrity testing were not available for review.

Ganes proposes investigation activities for AOC – UTA-8.

AOC – UTA-9 (Former UST)

Location: OSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-1

Photograph: None

AOC–9 is located inside Room 27 of the OSFP. According to historical site plans, a 2,000-gallon caustic UST was observed on the 1949 and 1964 historical site plans reviewed. Information pertaining to content, removal activities or integrity testing of the UST was not available for review.

Ganes proposes NFA for AOC – UTA-9 because:

- There was no indication that the tank remains on-site;

- The tank is not reported in operations by employees interviewed; and
- If a release had occurred prior to 1964, the material would have most likely degraded to an equilibrium status.

AOC – UTA-10 (Makeup Water UST)

Location: OSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-1

Photograph: No. 30

AOC–10 is located inside Room 27 of the OSFP. The 20,000-gallon tank was installed prior to 1949 and reportedly was historically and is currently used to store make-up water in production obtained from water well #2. Information pertaining to construction, dimensions, or integrity of the UST was not available for review.

Ganes proposes NFA for AOC – UTA-10 because:

- According to site records and employee interviews, UTA-10 was historically been used to store makeup water from production well No. 2 (AOC - 87).

AOC – UTA-11 (Former USTs)

Location: OSFP

Figure: Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)

Description: Appendix E-1

Photograph: No. 31

AOC-11 is located in a grassy area adjacent to Room 31 of the OSFP. UTA-11 consisted of three former 5,000-gallon steel tanks (No. 23, 24, & 25) which were installed prior to 1949 and removed after 1981. The USTs contained unknown solvents (diethyl carbonate in tanks 23 & 24). According to facility personnel, the USTs were removed and surrounding soils excavated and properly disposed of off-site. Information pertaining to removal, integrity testing or construction of the USTs was not available for review.

Ganes proposes investigation activities for AOC – UTA-11.

THE FOLLOWING MATERIAL STORAGE AOCS WERE IDENTIFIED IN LOT 10 OF THE OSFP.

AOC - MSA-40 (Room 27)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-40 was identified as a material storage area located in Room 27 (former packaging plant/current manufacturing) of the OSFP. The area was identified as a hazardous materials storage area for the storage of aminophyline, phenobarbital and pentobarbital metallic in cardboard drums. This area was historically and is currently used to store finished products. The floor of Room 27 is constructed of concrete and maintains floor trenching along each interior wall that discharges to a sump within the room for ultimate discharge to the on-site wastewater neutralization tank.

Ganes proposes NFA for AOC – MSA-40 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The room is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release; and
- Any spill or releases from MSA-40 would have been contained by the trenching system that will be assessed as AOC - DS-76.

AOC - MSA-41 (Room 28)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: No. 30

AOC-41 was identified as a material storage area located in Room 28 (storeroom) of the OSFP. The area was identified as a hazardous materials storage area for the storage of diethyl carbonate, ethyl bromide, oil, alcohol, salt, trisodium phosphate, calcium chloride, sodium nitrite, diethyl sulfate, soda ash, sodium acetate, sodium phosphate, oil, sodium cyanide and sodium hydrosulfite. The floor of Room 41 is constructed of concrete and maintains floor trenching along each interior wall that discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-41 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The room is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release; and
- Any spill or releases from MSA-41 would have been contained by the trenching system that will be assessed as AOC - DS-77.

AOC - MSA-42 (Room 30)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-42 was identified as a material storage area located in Room 30 (storeroom) of the OSFP. The area was identified as a hazardous materials storage area for the storage of diethyl carbonate, ethyl bromide, oil, alcohol, salt, trisodium phosphate, calcium chloride, sodium nitrite, diethyl sulfate, and sodium cyanide (Storage of DEA-controlled materials). The floor of Room 30 is constructed of concrete and maintains floor trenching along each interior wall that discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-42 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The room is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release; and
- Any spill or releases from MSA-42 would have been contained by the trenching system that will be assessed as AOC - DS-79.

AOC - MSA-43 (Room 29)

Location: OSFP
Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Description: Appendix E-3
Photograph: None

AOC-43 was identified as a historical material storage area located in Room 29 of the OSFP. The area was identified as a hazardous materials storage area for the storage of alcohol in steel drums and machinery. The floor of Room 29 is constructed of concrete and maintains floor trenching along each interior wall that discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-43 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The room is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release; and

- Any spill or releases from MSA-43 would have been contained by the trenching system, which will be assessed as AOC - DS-78.

AOC - MSA-44 (Room 32)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: No. 32

AOC-44 was identified as a material storage area located in Room 32 of the OSFP. The area was identified as a hazardous materials storage area for the storage caustic soda, chloroacetic acid, urea, iron powder, ammonia and finished product. The floor of Room 29 is constructed of concrete and maintains floor trenching along each interior wall that discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-44 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The room is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release; and
- Any spill or releases from MSA-44 would have been contained by the trenching system, which will be assessed as AOC - DS-81.

AOC - MSA-45 (Outside Room 29 & 31)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-45 is located outside Rooms 29 and 31 of the ORFP and is identified as the orchard street facility outside storage area of raw and in-process materials. Materials are stored in appropriate containers on spill containment, which is located in concreted area that slopes to facility trenching for ultimate discharge to the on-site wastewater system.

Ganes proposes NFA for AOC – MSA-45 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The storage pad is constructed on concrete;
- Materials are stored on secondary containment;
- The area is sloped to a drainage swale, inlet and sump in case of a spill or release;
- The area will be assessed as part of AOC - UTA-11.

AOC - MSA-46 (Outside Former Storage)

Location:	OSFP
Figure:	Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Table:	Material Storage Area Descriptions (Appendix E-3)
Photograph:	No. 31

AOC-46 is located outside in the grassy area of OSFP and was identified as a historical storage area of acetic anhydride and mother liquors in drums. Currently the area is not used for storage of materials but it is the location of former solvent USTs.

Ganes proposes NFA for AOC – MSA-46 because:

- No staining was observed;
- Any surficial residual soil impact would have been removed during removal activities of the USTs associated with AOC – UTA-11; and,
- If contamination is present it will be addressed as part of the investigation activities proposed in AOC – UTA-11.

AOC - MSA-47 (Room 31)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-47 was identified as a historical material storage area located in Room 31 of the OSFP. The area was identified as a hazardous materials storage area for the storage of finished goods in powder form, which are stored in containers of up to 44 gallons. The floor of Room 31 is constructed of concrete with floor trenching along each interior wall that discharge to the on-site wastewater treatment system.

Ganes proposes NFA for AOC – MSA-47 because:

- No spill or releases were reported;
- No staining was observed associated with spills or releases;
- The room is constructed on concrete;
- The area is sloped to floor drains in case of a spill or release; and
- Any spill or releases from MSA-47 would have been contained by the trenching system, which will be assessed as AOC - DS-80.

THE FOLLOWING DRAINAGE SYSTEM AOCS WERE IDENTIFIED IN LOT 10 OF THE OSFP.

Numerous drainage system process trenching including open and closed process trenches, sumps, clean-outs, swales and storm drains AOCs were identified in Lot 10 of the OSFP.

As indicated on the Drainage Systems drawing attached as Appendix J-3 (Sheet 4 of 4), most process area trenches are discrete to a given processing room. Very few trenches are interconnected between processing rooms, except where they tie into the chemical sewer or storm sewer for treatment prior to discharge. For wet processing areas, a concrete or terra cotta trench typically runs along one, two, or more walls and conveys water to the wastewater neutralization tank (AOC – UTA-1) for treatment prior to discharge to the sedimentation tank (AOC – UTA-16).

AOCs related to drainage systems have been designated by either room or process area for each room or outside area where concerns are located. Historically, trenches may have been upgraded or refurbished though documentation or testing of subsurface materials was not completed. Some trenches or sumps have been filled with concrete and abandoned in place. Others have been replaced with new concrete or new terra cotta piping. However, without documentation of subsurface material testing or site observations during closure or upgrade, the possibility for impacts exists even beneath the closed trenches. As such, closed trenches will be included as an AOC and will be regarded the same as open trenching. Similarly, sumps are typically constructed with concrete linings and may have been closed in place.

The majority of the floor drain systems were in fair condition and some rooms were noted to have severely corroded systems. The majority of the exterior drainage systems were observed to be in good condition with little corrosion or deterioration. However, it was not possible to determine the integrity of the joints located approximately every two feet within the terra-cotta trenching systems.

A description of each AOC associated with drainage systems located at the OSFP is provided below.

<u>AOC - DS-75 (Room 26)</u>

Location:	OSFP
Figure:	Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description:	Appendix E-4
Photograph:	None

Room 26 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to the southeast corner of the room where it cuts across the alley way via a covered trench to Room 27 ultimately for discharge to the neutralization tank located on the GSFP. Approximately 128 l.f. of terra-cotta and concrete trenching are located in Room 26. The trenching system was recently upgraded and appeared to be in good condition. However, the condition of the trenching system prior to upgrading is unknown.

Ganes proposes Investigation Activities for AOC – DS-75.

AOC - DS-76 (Room 27)

Location: OSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photograph: None

Room 27 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to an approximately 50-gallon concrete sump. The sump is located along the northwest wall ultimately discharging to the neutralization tank. Approximately 113 l.f. of terra-cotta and concrete trenching and an approximately 50-gallon sump are located in Room 27. Areas of corrosion and deterioration were observed within the trenching system. Room 27 also acts as the wastewater collection center for all process rooms on the OSFP. Wastewater is gravity fed from rooms 26, 28, 29, and 30 to the sump located in Room 27 and wastewater is pumped via an overhead line from Room 32 following gravity feed from Rooms 31 and 32.

Ganes proposes Investigation Activities for AOC – DS-76.

AOC - DS-77 (Room 28)

Location: OSFP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photograph: No. 30

Room 28 has historically been utilized as chemical material storage room. Wastewater has not historically been generated and is only produced during a spill cleanup and according to site personnel no spills or releases have occurred within the room. Approximately 52 l.f. of closed terra-cotta and concrete trenching and one closed floor drain are located in Room 28. Some areas of corrosion and deterioration are associated with the floor drain system.

Ganes proposes Investigation Activities for AOC – DS-77.

<u>AOC - DS-78 (Room 29)</u>

Location: OSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4
Photograph: None

Room 29 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed through the northwest wall to Room 27 ultimately discharging to the neutralization tank. Approximately 88 l.f. of terra-cotta and concrete trenching are located in Room 29. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-78.

<u>AOC - DS-79 (Room 30)</u>

Location: OSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4
Photograph: None

Room 30 has historically been utilized as a finished materials storage room/warehouse. Wastewater has not historically been generated and is only produced during a spill cleanup. According to site personnel no spills or releases have occurred within the room. Wastewater if generated is conveyed through open terra-cotta and concrete trench to an underground line to sump located in Room 32. The sump discharges via an aboveground line to the sump located in Room 27 for ultimate discharge to the neutralization tank. Approximately 28 l.f. of terra-cotta and concrete trenching are located in Room 30. No areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-79.

AOC - DS-80 (Room 31)

Location: OSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4
Photograph: None

Room 31 has historically been utilized as a manufacturing room. Industrial process wastewater is conveyed through open terra-cotta and concrete trenches via gravity feed to underground lines to a sump located in Room 32. The sump discharges via an aboveground line to the sump located in Room 27 for ultimate discharge to the neutralization tank. Approximately 95 l.f. of terra-cotta and concrete trenching, an approximate 20-gallon sump and associated cleanout are located in Room 31. Areas of corrosion and deterioration were observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-80.

AOC - DS-81 (Room 32)

Location: OSFP
Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)
Description: Appendix E-4

Photograph: None

Room 32 has historically been utilized as a finished materials storage room/warehouse. Wastewater has not historically been generated and is only produced in the event of a spill cleanup. According to site personnel no spills or releases have occurred within the room. Wastewater, if generated, is conveyed through an open terra-cotta and concrete trench via gravity feed to an approximate 50-gallon sump. Wastewater in the sump is conveyed via an aboveground line to Room 27's sump for ultimate discharge via an aboveground line to the neutralization tank. Approximately 46 l.f. of terra-cotta and concrete trenching is located in Room 32. No corrosion or deterioration was observed within the trenching system.

Ganes proposes Investigation Activities for AOC – DS-81.

AOC - DS-82 (Outside Rooms 29 & 31)

Location: OSFP
Figure: Drainage Systems (Appendix J-3 Sheet 4 of 4)
Description: Appendix E-4
Photograph: None

The facility maintains a drainage swale, inlet and vault outside Rooms 29 and 31 of the OSFP. The drainage swale is newly constructed of concrete and extends along a material storage area (AOC – MSA-45) to a vault located in the grassed area for ultimate discharge to Outfall DSN-021 located along Broad Street.

Ganes proposes NFA for AOC – DS-82 because:

- The drainage swale and sump have only contained storm water;
- Historically, no spills or released have occurred in the area which could have caused a release to the environment from within the drainage swale or sump; and
- The drainage swale and sump appeared in good condition with no cracks, corrosion

or deterioration noted.

AOC-86 (Transformer)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-5

Photograph: No. 31

AOC-86 is a transformer located in the grassy area outside the south side of Room 31 of the OSFP. The transformer has been installed within the past three years and is owned and operated by PSE&G.

NFA is proposed for AOC–86 because:

- No staining or historical discharges from the transformer were reported or observed.

AOC-87 (Production Well #2)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-5

Photograph: No. 31

AOC-87 is production well #2 located within Room 32 of the OSFP. The well is permitted under an NJDEP water allocation permit #2055.

Ganes proposes investigation activities for AOC–87 which includes sampling the production well:

AOC-88 (Production Well #5)

Location: OSFP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-5

Photograph: No. 31

AOC-88 is production well #5 located in the grassed area outside Room 31 at the OSFP. The well is permitted under an NJDEP water allocation permit #2055.

Ganes proposes investigation activities for AOC–88 which includes sampling the production well.

BUILDING INTERIOR DESCRIPTION FOR LOT 10 OF THE OSFP.

As documented in Appendix E-5, the OSFP maintain within the manufacturing rooms numerous process kettles, centrifuge condensers, drop tanks, pressure filters, shakers, marmites, and vacuum blenders. Each manufacturing room maintains process floor trenching. Any spill or releases from the process equipment and associated product lines would be contained within the trenching systems and are assessed as Drainage System Areas.

GARDEN STREET WAREHOUSE PROPERTY (GSWP)

The Garden Street Warehouse Property is comprised of Block 2, Lot 8 and contains the material storage warehouse, sodium storage building, raw and in-process outside storage pad, empty drum storage and dumpster area, and production water well/pump house #4. The remainder of the lot is open grassed areas. The Site Plan (Sheet 1 of 4) identifying each lot and block is provided attached under the "Figures" section of the document.

Ganes purchased the GSWP in 1947, prior to which the property was vacant. The warehouse, sodium storage building, and drum storage pad have been utilized to store raw process chemicals since construction.

The following AOCs were identified on Block 2, Lot 8 of the GSWP.

THE FOLLOWING BULK UNDERGROUND STORAGE TANK AOC WAS IDENTIFIED IN LOT 8 OF THE GSFP.

AOC – UTA-12 (Former UST Area)

Location: GSWP

Figure: Bulk Storage Tanks (Appendix J-2, Sheet 2 of 4)

Description: Appendix E-1

Photograph: No. 33

AOC-12 is located in a grassed area just west of the empty drum storage area of the GSWP. UTA-12 consisted of three 1,000-gallon tanks identified on the 1964 historical site plan. The historical tank contents are unknown and information pertaining to removal activities, integrity testing or construction of the USTs was not available for review.

Ganes proposes investigation activities for AOC – UTA-12.

THE FOLLOWING MATERIAL STORAGE AREA AOCS WERE IDENTIFIED IN LOT 8 OF THE GSFP.

AOC - MSA-25 (Material Storage Warehouse)

Location: GSWP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: No's. 34 & 35

AOC-25 consists of the material storage warehouse building on the GSWP. The warehouse is used to store raw materials in both powder and liquid form for production activities conducted at the GSFP. The materials are delivered through the main gate located of Garden Street. All materials are stored in compatible containers ranging in size form 1 to 55-gallons. The flooring of the warehouse is constructed of concrete. One section of floor trenching was observed in the main area of the warehouse (addressed as AOC – DS-83). This trench was observed to be deteriorated. The remainder of the trenching appeared to be in good condition.

Ganes proposes NFA for AOC – MSA-25 because:

- No cracks or other areas of breaching were observed in the concrete flooring material of the storage warehouse;
- No spill or releases were reported to have occurred which had the potential to impact the environment; and
- If a spill or release occurred the material would be contained in the trenching system

that will be assessed along with AOC – DS-83.

AOC - MSA-26 (Drum Storage Pad)

Location: GSWP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: No's. 35 & 36

AOC-26 consists of the outside storage pad located on the GSWP. The outside storage pad is used to store raw materials in both powder and liquid form for production at the GSFP. The materials are stored in compatible containers ranging in size form 1 to 55-gallons and stored in either plastic or metal drums. The storage pad is constructed of concrete, which is curbed and sloped toward a sump located on the northwest corner of the storage pad. Accumulated rainwater is pumped from the sump through an aboveground line to material storage warehouse (AOC – MSA-25) for ultimate disposal through the warehouse trenching system (AOC – DS-83). The integrity of the concrete pad, sump and aboveground piping were in good condition, no cracks, staining or evidence of releases were observed.

Ganes proposes further investigation activities associated with the sump located on the northwest corner of the storage pad.

AOC - MSA-27 (Sodium Storage building/Spill Area)

Location: GSWP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-3

Photograph: None

AOC-27 is comprised of the sodium storage building and an area of reported materials dumping located on the GSWP. The sodium storage building historically was used to store sodium, lithium diisopropyl amide (dissolved in tetrahydrofuran) and other reactive materials. The sodium storage building is located bordering the outside storage pad (AOC – MSA-26) to the north. The materials were stored in either solid or liquid state, stored in compatible containers ranging is size from 1 to 120-gallon containers. No areas of suspect integrity flaws or staining on the concrete floor were observed.

According to some site personnel, reported materials dumping used to take place at the rear of the sodium storage building. No areas of stressed vegetation were observed, however, the area is steeply sloped to the nearby property.

Ganes proposes investigation activities for AOC – MSA-27 associated with the reported materials dumping behind the sodium storage building.

AOC - MSA-28 (Empty drum storage/dumpster and Soil Pile Area)

Location: GSWP
Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)
Description: Appendix E-3
Photograph: No. 33 & 37

The empty drum storage area is located on the most northeast corner of the lot. The area is fenced and constructed with a concrete fork lift driveway extending through the center and surrounded by gravel fill. Located within the empty drum storage area are also dumpsters and a soil pile (~5 cubic yards) associated with spoils generated during upgrading the trenching system in manufacturing rooms at the GSFP. The area has historically been used to store empty drums and house the facility dumpster. Empty drums are stored on ether side of the concrete on a gravel surface. The dumpster is maintained on a portion of the concrete pad. It is uncertain how long the areas have been utilized as an empty drum storage area and if the area was ever used to store hazardous materials.

Ganes proposes further investigation activities for AOC – MSA-28.

AOC – DS-83 (Discharge Trenching System)

Location: GSWP

Figure: Drainage Systems (Appendix J-3, Sheet 4 of 4)

Description: Appendix E-4

Photograph: No. 34

AOC-83 is comprised of the drainage trenching system and associated sump located within the GSW Material Storage Building.

As indicated on the drawing, the trenching system is interconnected between rooms/areas of the warehouse for ultimate drainage to a sump and final discharge to the sanitary sewer system. The majority of the floor drain system was in good condition with the exception of one area of deterioration located in the main area of the warehouse.

Ganes proposes investigation activities for AOC – MSA-83.

AOC-89 (Production Well #4)

Location: GSWP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-5

Photograph: No. 33

AOC-89 is production Well #4 (Permit No. 2600005) and is 395 feet deep, located on the most northern corner in the grassed area of the GSWP. The well is permitted under an NJDEP water allocation permit #2055.

Ganes proposed investigation activities for AOC–89, which include sampling the production well.

SCHARG WAREHOUSE PROPERTY (SWP)

The Scharg Warehouse Property is comprised of Block 23, Lots 1, 1A, 1B, and 2, and contains a former silk factory (current equipment storage), office building, emergency equipment storage shed, and grassy areas. The Site Plan (Sheet 1 of 4) identifying each lot and block is provided attached under the "Figures" section of the document. A description of each lot and block is provided below.

Lot 1, 1A, and 1B (SWP)

In 1902, the Scharg Bros. Silk Factory occupied the western portion of Lot 1. According to available information, the Scharg Silk Factory was historically utilized to produce fabric. Warehousing has occurred on the property since Ganes purchased it in 1968. Reportedly, no industrial/production activities were conducted at the warehouse. Currently, the warehouse is used to store old equipment and cardboard drums. Three residential dwellings were historically present, one along Garden Street north of the warehouse and two along Broad Street just south of the office building. The residential dwellings were recently raised and removed. The date of purchase for Lot 1 could not be accurately assessed from the Chain of Title search.

The corporate office building located on the most northeastern portion of the lot was constructed in 1987 and is used primarily as office space.

Lot 2 (SWP)

Lot 2 is currently undeveloped and was purchased by Ganes 1998. A residential dwelling was constructed on the lot sometime before 1909 and removed/demolished in 1998.

The following areas of concern were identified on Block 23 of the SWP.

AOC – UTA-14 (Former UST Area)

Location:	GSWP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-1
Photograph:	No's. 38 & 39

According to employee interviews, AOCs-14 is located in a grassy area adjacent the eastern side of the Scharg Building of the SWP. UTA-14 consisted of heating oil tanks used to provide oil for on-site boilers. Information pertaining to size, location, removal activities and integrity of the USTs was not available for review. According to site personnel, the tanks were located on the east side of the Scharg Warehouse building. Since no data was available regarding the exact location of the tanks an additional AOC (UTA-15) as addressed below was also identified as a probable location of the former tanks.

Ganes proposes investigation activities for AOC – UTA-14.

AOC – UTA 15 (Former UST Area)

Location:	GSWP
Figure:	Bulk Storage Tanks (Appendix J-1, Sheet 2 of 4)
Description:	Appendix E-1
Photograph:	No's. 38 & 39

According to employee interviews, AOCs 15 is located in a grassy area adjacent the east side of the Scharg Building of the SWP. UTA-15 consisted of heating oil tanks used to provide oil for on-site boilers. Information pertaining to size, location, removal activities and integrity of the USTs were not available for review. Exact locations of the two tanks is also unknown, however, according to site personnel, the tanks were located on the east side of the Scharg Warehouse building.

Ganes proposes investigation activities for AOC – UTA-15.

AOC-85 (Transformer)

Location: GSWP

Figure: Material Storage and Other Areas (Appendix J-2, Sheet 3 of 4)

Description: Appendix E-5

Photograph: None

AOC-85 is a transformer located in the grassy area outside the eastern side of the office building of the SWP. The transformer was installed in 1987 when the office building was constructed and is owned and operated by PSE&G.

Ganes proposes NFA for AOC–85 because:

- No staining or historical discharges from the transformer was reported or observed; and
- The transformer was installed in 1987 and is owned and operated by PSE&G.

APPENDIX F

DISCHARGE HISTORY OF HAZARDOUS SUBSTANCES AND WASTES
(Question 7)

SEE "START" TO END

APPENDIX F-1

RELEASE SUMMARY

APPENDIX F-1
RELEASE SUMMARY

DATE OF INCIDENT	MATERIAL	AMOUNT RELEASED	IMPACTED AREA	DESCRIPTION OF INCIDENT	WAS THE NJDEP NOTIFIED?	CASE NUMBER	REGULATORY STATUS
04/04/96	Ethyl-1-methyl-2-pentynyl-cyanoacetate Methanol Residue	15 gals	Soil	Drum boiled over while on heater. Less than then 10 gal. entered industrial sewer, nothing left on site. cleanup of boiler room completed.	Yes	96-4-4-0122-35	UK
02/15/94	Toluene	10 gals	Soil, Water	Spill due to valve being left open and material entered sewer system.	Yes	94-2-15-1443-13	UK
1989	Toluene	UK	Soil	Impacted soils were encountered during removal of USTs 10, 11, & 12 (AOC – UTA-5).	Yes	89-07-26-1007	UK

APPENDIX G

REMEDIAL INVESTIGATION REPORT
(Question 8)

Remedial Investigation Report

ISRA Case No. E99826

Ganes Chemicals, Inc., Property
630 Broad Street
Carlstadt, New Jersey 07072

April 2000

Prepared for:

Ganes Chemicals, Inc.
33 Industrial Park Road
Pennsville, New Jersey 08070

Prepared by:

McLaren/Hart, Inc.
470 Norristown Road, Suite 300
Blue Bell, Pennsylvania 19422

Axel E. Schwendt
Associate Geoscientist

Charles Phillips, P.G.
Senior Environmental Scientist

McLaren/Hart, Inc.

SCIENCE • STRATEGY • TECHNOLOGY • SOLUTIONS

TABLE OF CONTENTS

TABLE OF CONTENTS (con't.)

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Ganes Chemicals, Inc. ("Ganes"), a Delaware Corporation, owns and operates a manufacturing facility located at 601-630 Broad Street in the City of Carlstadt, Bergen County New Jersey, hereinafter referred to as "Facility" or "Site". The Facility's operations have consisted primarily of the manufacture of fine chemicals and intermediates for the pharmaceutical industries. As part of its ongoing business operation, Ganes decided to evaluate the subject Site to determine its potential with respect to the corporation's future vision. As part of the evaluation, Ganes retained McLaren/Hart, Inc. ("McLaren/Hart") to conduct a limited site inspection and environmental review of the Site. The purpose of the site inspection and environmental review was to identify possible environmental impacts associated with former Site operations.

During the course of the preliminary review, McLaren/Hart identified multiple potential Areas of Concern ("AOCs") as defined in the New Jersey Administrative Code (N.J.A.C. 7:26E-3.9). The results of the investigation were presented in *a Phase I and Limited Phase II Environmental Assessment Report* prepared by McLaren/Hart dated March 16, 1999. McLaren/Hart was subsequently retained to conduct a site-wide groundwater quality study to determine if any significant environmental impacts had occurred at the site.

During the course of the site-wide investigation, McLaren/Hart confirmed that a release had occurred relative to three former 550-gallon toluene tanks. Subsequently, Ganes Chemicals entered into a Memorandum of Agreement ("MOA") with the New Jersey Department of Environmental Protection (NJDEP) which became effective on October 7, 1999 (Case Number 99-09-10-0602-36). The MOA was designed not only to address the release from the former toluene tanks but also addressed full characterization of the site.

1.1 OBJECTIVE

A Remedial Action Selection Report (RASR) dated December 10, 1999 was submitted to the NJDEP for its review and approval. The objective of the Remedial Investigation was to characterize the extent and determine the nature of possible soil and groundwater contamination at the site relative to operations of three former 550-gallon toluene underground storage tanks (USTs). The tanks were removed in 1989 and a replacement tank was subsequently installed in the same location, hereinafter referred to as "toluene UST area" or "source area". The Remedial Investigation focused on delineating the vertical extent of contamination and the nature of contamination in the soil and groundwater in the area of the former tanks.

1.2 SITE HISTORY AND DESCRIPTION

The Ganes facility is located on Broad Street in the City of Carlstadt, New Jersey, as identified on Figure 1. The Property consists of four blocks of factory, warehouse and storage areas used for the manufacturing of medicinal and fine chemicals for the pharmaceutical industry. The toluene UST area is located on Block 18, Lot 10, north of the Broad Street and Orchard Street intersection, which houses the main manufacturing areas. The site geology/hydrogeology is presented below.

2.0 ENVIRONMENTAL SETTING

The Ganes Chemical facility is located in a mixed residential and commercial section of the City of Carlstadt, Bergen County, New Jersey (Figure 1). Surface topography at the site consists of rolling hills and river terraces. Elevations at the site range from 100 to 110 feet mean sea level. The subject site is generally level and at grade with adjacent properties to the north. However, the property elevation is approximately 10 to 15 feet above the commercial properties adjoining the site to the southeast and west. The Passaic River, the nearest surface water body, lies approximately 1.25 miles west of the site.

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

The Site is situated in the Piedmont Physiographic Province just southeast of the Highland Province in northeastern New Jersey. Rock formations of the Piedmont Province are of Late Triassic and Early Jurassic Age. The area is underlain by conglomerates, sandstones, siltstones, and shales, which together make up the Brunswick Formation, the predominant rock type in northeastern New Jersey. Shales in the formation grade into sandstones which are frequently conglomeritic. In Bergen County, bedrock exposures show evidence of these sandstones and conglomerate interlayed with shale.

The Brunswick Formation is the most important water-producing unit in this region. Groundwater occurs primarily in fractures and joints, and in lenses of poorly cemented sand and gravel (Vecchioli and Miller, 1973). Fractured shales of the Brunswick Formation provide a major aquifer in the most industrialized region of New Jersey (Michalski, 1990).

The Brunswick Formation consists of a series of aquifers and aquicludes, which are oriented parallel to the nearly horizontal bedding planes. The degree of hydraulic connection between the water-bearing zones depends on the quantity and width of vertical fractures. The amount of open fracture area tends to decrease with depth. Groundwater in the Brunswick Formation is generally under artesian conditions. Wells typically yield approximately 100 gallons per minute (gpm) but can attain yields as high as 600 gpm. Regional bedrock groundwater flow is strongly controlled by the structural features within the formation. Based on groundwater elevation measurements in monitoring wells at the Facility, groundwater flow direction is generally towards the west.

Above the Brunswick Formation, some of the well-sorted glacial deposits also produce useful quantities of water (Carswell, 1976). However, these water-bearing zones are generally of limited areal extent. Most of the overburden aquifers are poorly sorted, and water production is far less than in the Brunswick Formation. The overburden aquifers are unconfined and flow is generally controlled by topography (Spayd, 1985).

2.2 SITE GEOLOGY AND HYDROGEOLOGY

Bedrock at the site it at an average depth of approximately twenty-two feet (22') below surface grade. Information acquired during well installations revealed very few fracture zones to a depth of sixty feet (60') below grade. Groundwater was encountered at an average depth of twelve feet (12') below grade. Unconsolidated sediments overlying the bedrock are comprised mostly of reddish-brown sandy silts and silty sands with trace clay and some gravel. Areas of more clayey sediments are also found underlying the facility. Groundwater elevations measured in the on-site wells indicate that groundwater generally flows in an westerly direction, which conforms to the general slope of the local topography.

3.0 TECHNICAL OVERVIEW

3.1 GENERAL PROFILE

The purpose of this investigation was to evaluate viable remedial objectives for impacted groundwater in the region of the three former 550-gallon toluene USTs. In order to investigate the extent of groundwater impact, monitoring wells were installed around the source area. Soil samples were obtained to evaluate potential impacts in the unsaturated zone and to evaluate the potential for in-situ remediation technologies.

Monitoring well locations were selected in an effort to determine the extent of impact from the toluene UST area in the shallow and intermediate water bearing zones. McLaren/Hart installed a total of five (5) wells in the vicinity of the toluene UST. Four (4) of these wells were installed within the shallow water bearing zone. One (1) deeper well was installed immediately downgradient of the source area in order to evaluate the vertical extent of impact. It should be noted that the limited space within the area of concern restricted the placement of some of the monitoring wells.

Prior to the installation of the groundwater monitoring wells, McLaren/Hart contacted the New Jersey "One Call" System to perform the required underground utility mark-out. McLaren/Hart also utilized knowledgable facility personnel who were familiar with the facility to locate underground utilities. Additionally, McLaren/Hart contracted EnviroPhysics of New Jersey to conduct ground-penetrating radar (GPR) within the areas of the proposed well locations.

3.1.1 Soil Borings/Soil Sampling

As part of the well installation process, McLaren/Hart collected continuous split-spoon soil samples wherever possible from within the overburden or weathered bedrock zone. The split-spoon samples were used to log the lithology at each well location, as shown in Appendix A, and provide samples for field screening and sample analysis. Drilling was completed using hollow-stem augers. Once competent bedrock was reached, the borings were advanced to final depth using mud rotary drilling methods. Evaluation of the depth and nature of bedrock fractures was based on field observations (e.g., the rate and ease of drilling, mud loss, etc.).

Field screening of split-spoon samples was conducted using a photoionization detector (PID). Based on field screening evidence (elevated PID readings) and visual evidence of contamination, one soil sample was collected from each borehole, except MW-4D, from which no soil samples were obtained. The soil samples were collected for VOC analysis using EPA Method 8260. The soil sample laboratory analytical data sheets are presented in Appendix B. The samples were collected using the methanol extraction method. Soil samples were collected in laboratory-supplied glassware and immediately placed in ice-filled coolers for preservation. The samples were shipped to QC Laboratories in Southampton, Pennsylvania, a New Jersey-certified laboratory, with the proper chain-of-custody documentation to insure the integrity of the samples.

3.1.2 Monitoring Well Installations

Five (5) groundwater monitoring wells, designated MW-4D, MW-7, MW-8, MW-9 and MW-10, were installed at the facility as part of this investigation. The monitoring wells were completed by Advanced Drilling of Washington, New Jersey, a licensed New Jersey Drilling company. The location of the monitoring wells is shown in Figure 2 and were chosen to provide information regarding groundwater quality in the area of concern.

Monitoring Wells MW-7, MW-8, MW-9 and MW-10 were screened in the shallow water-bearing zone. Monitoring Well MW-4D was screened at a depth of 50-60 feet below surface grade to evaluate groundwater quality in the intermediate water-bearing zone. General well construction details are as follows:

Shallow well construction:

- 4-inch diameter threaded PVC casing and screen (2-inch for MW-10);
- 0.010 slot screens;

- 10 to 15 foot screen lengths; and,
- Flush mount well construction.

Intermediate depth well construction:

- Double cased, 2-inch diameter threaded PVC casing and screen;
- 6-inch steel casing grouted into bedrock;
- 0.010 slot screen;
- 10 foot screen length; and,
- Flush mount well construction.

The shallow wells were installed to a depth of approximately twenty to thirty feet (20'-30') below grade. The intermediate depth well was installed to a depth of sixty feet (60') below grade. As previously mentioned, the intermediate depth monitoring well was installed as a double-cased well. Additional well construction specifications (e.g., sand pack size, annular seals) and well development were completed in accordance with NJDEP requirements.

Following well installation, each monitoring well was developed using a centrifugal pump until a relatively sediment-free discharge was produced (if possible). All development water generated during the installation program was contained in 55-gallon D.O.T. approved drums for future waste characterization sampling and disposal.

Monitoring well construction details are provided in the following table and in the diagrams in Appendix C.

Well No.	Total Depth (ft)	Screened Interval (ft)	Top of Sand Pack (ft)	Bentonite Seal (ft)	Cement Seal (ft)	NJDEP Well ID No.	Installation Date
MW-4D	60.0	50.0-60.0	48.0	47.0-48.0	Top-47.0		10/15/99
MW-7	20.0	5.0-20.0	3.0	2.0-3.0	Top-2.0		10/13/99
MW-8	21.0	6.0-21.0	4.0	3.0-4.0	Top-3.0		10/12/99
MW-9	20.0	5.0-20.0	3.0	2.0-3.0	Top-2.0		10/14/99
MW-10	29.5	9.5-29.5	7.5	6.5	Top-6.5		12/20/99

Notes:
Monitoring wells MW-7 through MW-9 constructed of 4" diameter, sch. 40 PVC screen and riser.

Monitoring wells MW-4D and Mw-10 constructed of 2" diameter, sch. 40 PVC screen and riser.
Measurements are in feet relative to ground surface.
TOC = Top of Casing

3.1.3 Groundwater Sampling

Groundwater samples were collected from each monitoring well except MW-10 on November 2 and 3, 1999. The wells were allowed to stabilize for greater than two weeks prior to sampling. Groundwater samples were collected from each newly installed well and from the six (6) existing wells (MW-1 through MW-6) installed during the Phase II Baseline Groundwater Investigation performed by McLaren/Hart. A groundwater sample was not collected from MW-5 which was dry at the time of sampling. The wells were sampled in accordance with the techniques presented in EPA's March 1998 Groundwater Sampling Procedure – Low Stress Purging and Sampling, and McLaren/Hart's Low Flow Sampling Plan attached as Appendix D.

Each sample was analyzed in the laboratory for VOCs and the following indicator parameters of biodegradation activity in groundwater: alkalinity, nitrate, sulfate, dissolved iron and manganese, methane, total dissolved solids (TDS), total organic carbon (TOC), biochemical oxygen demand (BOD), and chemical oxygen demand (COD). Groundwater laboratory analytical data are provided in Appendix E. A summary of the analytical parameters and their USEPA Method numbers are provided in the table below.

Paramters Analyzed	USEPA Method Number
Volatile Organic Compounds	8260B
Alkalinity	310.1
Nitrate	353.2
Sulfate	375.4
Dissolved Iron	200.7/SW846 6010
Dissolved Manganese	200.7/SW846 6010
Methane	Miscellaneous GC Method No.
Total Dissolved Solids	600 Method 160.1
Total Organic Carbon	415.1

Paramters Analyzed	USEPA Method Number
Biochemical Oxygen Demand	Standard, 18th ed, Method 5210
Chemical Oxygen Demand	410.4

Field measurements recorded during groundwater sampling included pH, dissolved oxygen, temperature, oxidation-reduction potential (ORP), turbidity, and conductivity, as provided in Table 3 "Summary of Field Parameters". Depth to water measurements and observations for the presence of Non-Aqueous Phase Liquids (NAPL) were conducted at each new and existing monitoring well. This task also included the collection of one sample from Well MW-4 to conduct bench-scale tests to assess the potential for using in-situ chemical oxidation as a treatment method for impacted groundwater.

The groundwater samples were collected using decontaminated and disposable sampling equipment to prevent cross-contamination. Samples were collected in laboratory-supplied glassware and immediately placed in ice-filled coolers for preservation. The samples were shipped to Raytheon Laboratories in Boothwyn, Pennsylvania, a certified laboratory with the proper chain-of-custody documentation to insure the integrity of the samples. All purge water generated was contained in D.O.T. approved 55-gallon drums and stored on-site for subsequent disposal.

It should be noted that the decision to install MW-10 was made after the installation of monitoring wells MW-4D, MW-7, MW-8 and MW-9. Consequently, MW-10 was installed on December 20, 1999, over two months after the installation of the other wells. In order to maintain the expedited time frame for the remedial investigations, a groundwater sample from MW-10 was collected shortly following its installation without allowing for well stabilization. As a result, the groundwater sample from MW-10 was used mainly as an indicator sample and analyzed only for VOCs by EPA Method 8260.

3.1.4 Aquifer Testing

Slug tests were used to obtain site-specific aquifer hydraulic conductivity (K) data. Data received from the slug tests were entered into a software program that utilizes the Bower and Rice calculation method to determine hydraulic conductivity. Field determined K values will serve as a primary input parameter for ground-water flow and solute transport estimates and for the development of a Classification Exception Area (CEA) for the Site.

Slug tests were performed on the following three shallow wells:

- one (1) newly installed shallow well (MW-8); and
- two (2) previously existing monitoring wells (MW-3 and MW-4).

Data from these tests were used to evaluate the variability in hydraulic conductivity (K) across the Site and within the affected water-bearing zones.

The general testing procedure outlined below is based on ASTM Standard Method D 4044-91 (*Standard Test Method (Field Procedure) for Instantaneous Change in Head (Slug Tests) for Determining Hydraulic Properties of Aquifers*). The need to conduct both Slug-In tests (falling head) and Slug-Out tests (rising head) depended upon Site conditions and well construction. If wells are installed with sand packs where the screen extends above the water table, only Slug-Out or "rising head" tests should be completed as the test results from Slug-In tests on these wells would tend to overestimate K values.

Although both "falling head" and "rising head tests" were performed, only "rising head" tests were used to estimate hydraulic conductivity since the screens for all three wells extended above the water table. A PVC slug of known volume (0.0917 gallons) was used. The following procedure was followed:

- The pre-test water level in the wells to be tested were measured.

- A pressure transducer was lowered into the select well to a point approximately 3 feet off the bottom of the well. The pressure transducer cable was secured to the well casing using duct tape and the position of the cable was marked using a permanent marker or chalk.
- The static water level was confirmed. The data logger was calibrated to read 0.00 feet at static conditions and record levels on a logarithmic scale.
- The PVC slug was lowered into the well to a point just above the static water level.
- The data logger was started.
- Immediately after starting the data logger, the PVC slug was lowered rapidly into the well until the slug was completely submerged (*Slug In or Falling Head Test*).
- The data logger was periodically "awakened" to ensure the unit was functioning properly. Data was continually recorded until the water level returned to approximately 60-80% of its pre-test level.
- The data logger was stopped and programmed for the *Slug-Out or Rising Head Test*.
- The data logger was started for the Slug-Out test.
- The PVC slug was removed rapidly and the water level data was recorded continuously until the levels stabilized to approximately 60-80% of its pre-test level.

A preliminary analysis of the data was conducted in the field to evaluate the data and determine if the test should be performed again. The results indicated that a reliable data set had been acquired.

In addition to performing aquifer slug tests, McLaren/Hart contracted In-Situ Oxidative Technologies, Inc. (ISOTECH) to conduct a treatability study on site-specific groundwater samples collected from the Ganes facility. The study was designed to evaluate the effectiveness of ISOTECH's Fenton-based oxidation on the groundwater samples. Based on the success of the lab study, a pilot program can be performed to gather additional data to evaluate the effectiveness of this remedial alternative to substantially reduce the organic loading in the contaminant source area. The ISOTECH Treatability Study Report is presented in Appendix F.

3.2 Quality Assurance/Quality Control

The Quality Assurance/Quality Control (QA/QC) documentation for the soil and groundwater sampling conducted in October 1999 through November 1999 is included in Appendix B. All groundwater analyses (except for the sample from MW-10) were conducted by Raytheon Laboratories located in Boothwyn, Pennsylvania. All soil analyses and groundwater analyses for the sample from MW-10 were conducted by QC Laboratories located in Southampton, Pennsylvania. The laboratory analytical reports are included in Appendix G.

All field procedures and laboratory analyses were conducted pursuant to the QAPP included in the Memorandum of Agreement (MOA) submitted to the New Jersey Department of Environmental Protection (NJDEP) Case Management Section in September 1999. The MOA was executed by Ganes Chemicals, Inc., and assigned NJDEP Case Number 99-09-10-0602-36.

4.0 SOURCE AREA FINDINGS

4.1 SOIL SAMPLING ANALYTICAL RESULTS

The analytical results for the soil samples collected during the recent well installations indicated only the presence of ethyl benzene and xylenes in MW-8. However, these concentrations were below the cleanup criteria. All other analytical parameters were not detected above the method detection limits in the soil samples. The analytical results for the soil samples are presented in Table 1 *"Summary of Soil Analytical Results"*.

4.2 SHALLOW WATER BEARING ZONE

The analytical results for the groundwater samples are presented in Table 4 *"Summary of Groundwater Analytical Results"*. Most of the analytical parameters were not detected in the samples. With respect to VOCs, the analytical results indicated that detectable levels of toluene were identified in the shallow wells MW-4 (250,000 ug/L), MW-7 (25 ug/L), MW-8 (6 ug/L), and MW-9 (14 ug/L). Toluene was detected in MW-3 but below the method detection limit. The toluene concentration detected in MW-4 was detected above the NJDEP Groundwater Cleanup Criteria of 1,000 ug/L. Of the remaining wells, vinyl chloride (<25 ug/L) was detected above cleanup criteria of 5 ug/L in MW-7 and benzene (4 ug/L) was detected above the cleanup critieria of 1 ug/L in MW-1 and its duplicate sample. Also, 4-methyl-2-pentanone was detected above the cleanup criteria in MW-10. The remaining parameters were either not detected or detected below the respective cleanup criteria.

With respect to PAHs, methane was detected in monitoring wells MW-3, MW-4 and MW-7. Dissolved metals iron and manganese were detected in all but the sample from MW-6 at concentrations ranging from below to above the cleanup criteria. Additional miscellaneous parameters detected in the groundwater samples are also presented in Table 4.

4.3 INTERMEDIATE WATER BEARING ZONE

During the groundwater sampling event conducted on November 2 and 3, 1999, monitoring well MW-4D was found to be filled with sediment to a level which rose above the screened interval (i.e., total well depth = 60 feet; depth to bottom of well during sampling = 30 feet). Though the groundwater within the well was sampled, the analytical results should be used only as an indicator for the presence of the analyzed compounds. The actual concentration levels may not be representative of those in the actual water earing zone.

During the installation of MW-10 on December 21, 1999, the sediment found in MW-4D was flushed out, the well was re-developed by purging approximately 100 gallons of water, and the groundwater was re-sampled for VOCs by EPA Method 8260. Table 4 (*"Summary of Groundwater Analytical Results"*) shows the VOC analytical data for the both groundwater sampling events for MW-4D. The remaining analytical data in Table 4 (semi-VOCs, dissolved metals and other miscellaneous parameters) are from the MW-4D sample collected on November 2, 1999.

In the initial groundwater sample obtained from MW-4D (November 2, 1999), toluene was detected above the cleanup criteria at a concentration of 3,200 ug/L. The sediment encountered in the well during sampling, however, filled the well to a level which rose above the screened interval and the sample was therefore not likely representative the local groundwater quality. In the subsequent groundwater sample obtained from MW-4D (December 21, 1999), toluene was detected below the cleanup criteria at a concentration of 210 ug/L. This second value was identified as an "E" value which indicates that the compound concentration exceeded the range of calibration of the instrument.

Other VOC parameters were also detected in both samples from MW-4D at concentrations below the cleanup criteria. Dissolved iron and manganese, sulfate and total dissolved solids were detected above the respective cleanup criteria. However, the concentrations detected were consistent with background concentrations commonly detected in native soils.

4.4 AQUIFER TEST ANALYTICAL RESULTS

The results from the slug test provided the following hydraulic conductivities for the three well tests performed:

Monitoring Well Number	Hydraulic Conductivity in ft/min
MW-3	2.41×10^{-4}
MW-4	1.24×10^{-4}
MW-8	9.49×10^{-5}

Data from these tests will be used to evaluate the variability in hydraulic conductivity (K) across the Site and within the affected water-bearing zones. The values can also be used to help implement a biological degradation program via the addition of microorganisms in an effort to reduce the mass of the toluene in the ground.

Results of the groundwater laboratory analysis performed by ISOTECH (Refer to Appendix F) indicate that a pilot program can be designed specifically for the site to apply a Fenton-based remedial technology. The pilot program will serve as an initial step toward remediating the site and ultimately applying the treatment program designed to reduce the concentrations of toluene detected in the groundwater at the Facility.

5.0 CONCLUSIONS AND RECOMMENDATIONS

In June 1999, toluene was detected in groundwater samples collected from a monitoring well installed immediately downgradient of the toluene UST area. The information was presented in a *"Phase II Baseline Groundwater Assessment"* Report dated July 1, 1999 prepared by McLaren/Hart, Inc. The source of the toluene is believed to be associated with three 550-gallon tanks that were removed from this same location in the summer of 1989. The former tanks were replaced with a single 2,000-gallon UST.

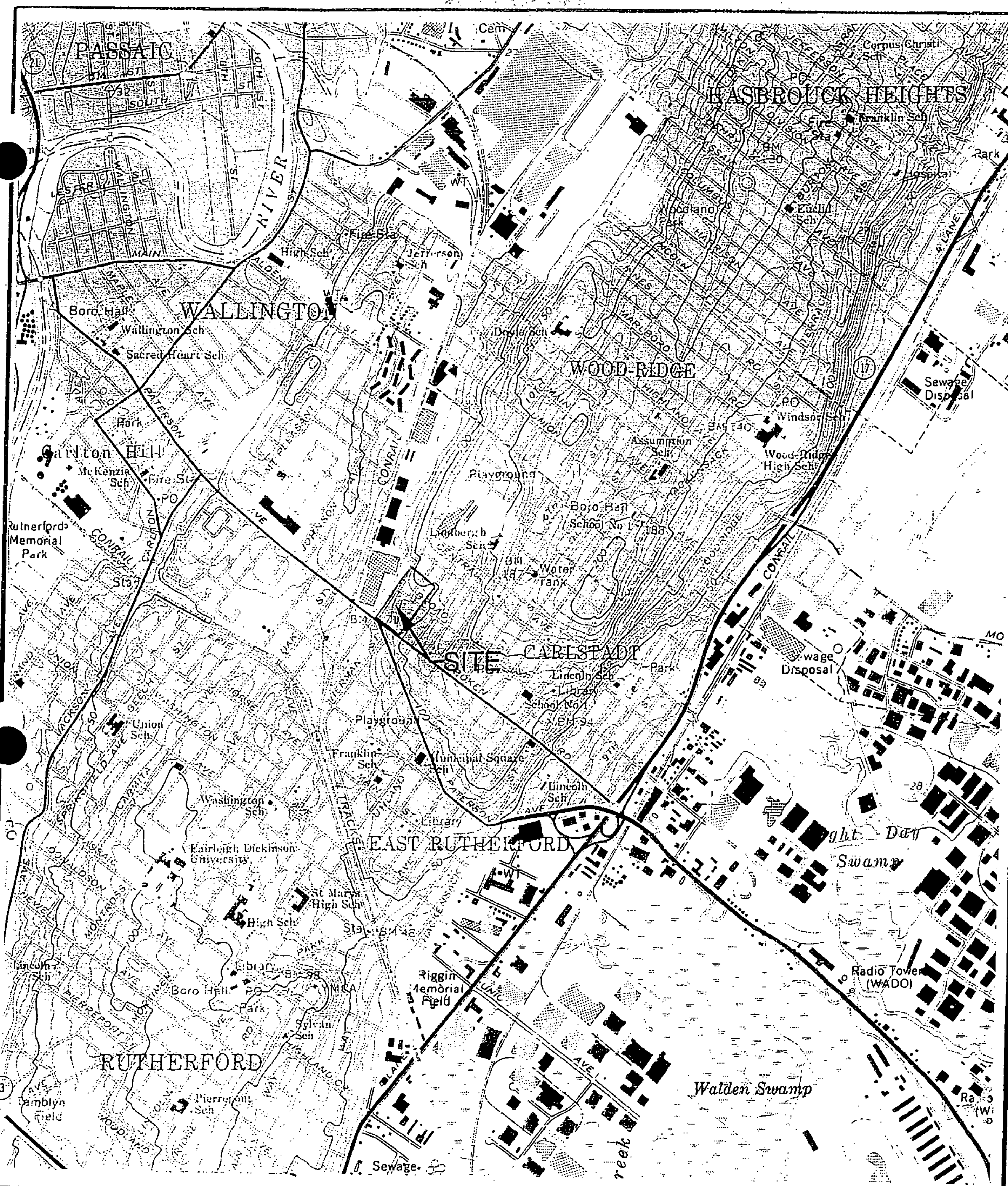
The toluene UST area is located in the center of the manufacturing plant in Block 18. The four new monitoring wells installed in the source area in October of 1999 (MW-4D, MW-7, MW-8 and MW-9) were placed such that potential impact from the former 550-gallon USTs to the shallow and intermediate water bearing zones could be properly evaluated. Access in this area was restricted to the interconnected alleyways which are typically less than thirty feet (30') wide.

The monitoring wells at the Ganes facility (except for MW-10) were sampled on November 2 and 3, 1999. Monitoring well MW-10 was sampled on December 21, 1999, at which time MW-4D was re-sampled. The analytical results from the groundwater sampling event indicate that relatively little migration of the toluene impact has occurred in the past ten years since the UST removals in 1989. Toluene concentrations in the former UST area range from 250,000 ug/L in the centrally located MW-4 to concentrations that are below the NJDEP Cleanup Criteria in the surrounding wells (MW-7, MW-8 and MW-9).

Based upon the findings of the recent groundwater sampling event, McLaren/Hart intends to install another well at the Ganes facility to begin remediation of the toluene UST area as outlined in the RASR dated December 10, 1999, and submitted to the NJDEP on December 13, 1999. The proposed well installation is adjacent to the location of the toluene UST to serve as an injection point for the application of a biological degradation remediation program.

Based on the successful ISOTECH lab study results received, McLaren/Hart is now able to initiate the pilot study necessary to gather the additional data for implementing a Fenton-based remedial technology. The Fenton-based process will be used to treat the organic constituents detected in the groundwater samples at the Facility. The approach works via the in-situ destruction of contaminants, while creating minimal disturbance to site operations. It is the opinion of McLaren/Hart that the biological degradation remediation program in combination with natural attenuation will be sufficient to properly address the concerns in the toluene UST area.

FIGURES



McLaren Hart, Inc.

SITE LOCATION MAP
GANES CHEMICALS, INC. PROPERTY

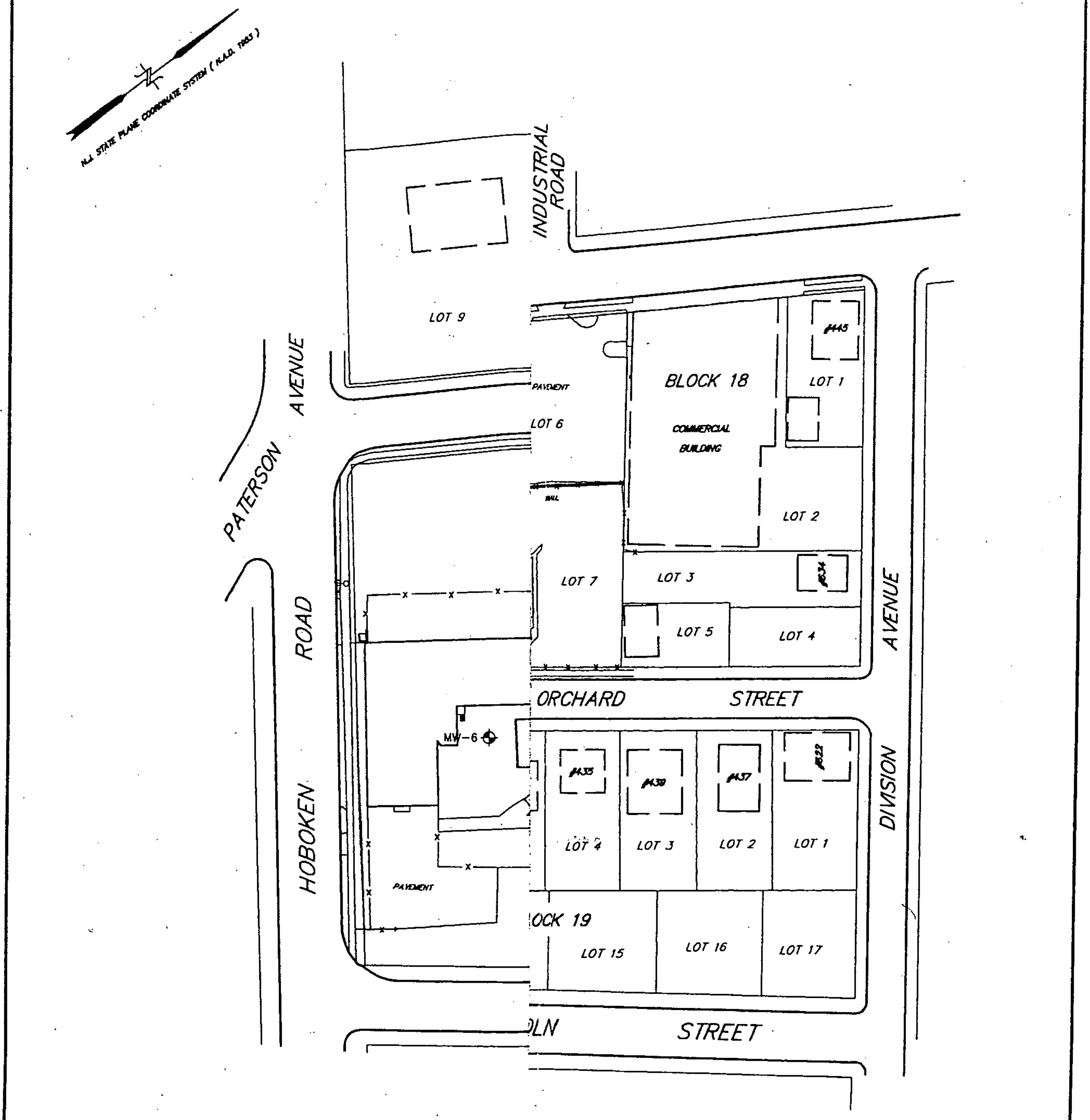
Carlsdadt, New Jersey
Scale 1" = 2000 Feet

FIGURE 1

Project No. 13-0001243-001-004

USGS Topographic Map
Weehawken N.J-N.Y Quadrangle
1967, photorevised 1981

FILE NO. 61180323
DATE: 03-16-00
CAD/DP FC



LEGEND

EXISTING MONITORING WELL LOCATION

GROUNDWATER FLOW DIRECTION

0 50 100 200

SCALE (FEET)

REV#	DATE	DESCRIPTION

NS

DRWN: FC	SCALE: AS NOTED
CHK'D:	DATE: 03-16-00
APP'D:	**FIGURE 2**

TABLES

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
GANES CHEMICALS INC., CARLSTADT, NEW JERSEY

Boring ID/Sample ID	(1) Impact to Groundwater Soil Cleanup Criteria	Units	MW-7 (11.5-12.0)	MW-8 (8.5-9.0)	MW-9 (16.5-17.0)	MW-10 (11.5-12.0)	TB
Date Sampled			10/12/1999	10/12/99	10/12/99	12/20/99	10/12/99
Date Analyzed			10/26/1999	10/25/99	10/26/99	12/28/99	10/25/99
Laboratory ID			L589348-3	L589348-1	L589348-4		L589348-5
Volatile Organic Compounds (VOCs)							
1,1-Dichloroethane	1	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
1,1,1-Trichloroethane	50	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
1,1,2,2-Tetrachloroethane	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
1,1,2-Trichloroethane	1	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
1,1-Dichloroethene	10	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
1,2-Dichlorobenzene	50	mg/kg	< 0.738	< 3.070	< 0.589	0.213J	< 0.625
1,2-Dichloroethane	1	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
1,2-Dichloropropane	--	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
1,3-Dichlorobenzene	100	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
1,4-Dichlorobenzene	100	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
2-Butanone	50	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
2-Chloroethyl vinyl ether	--	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
2-Hexanone	--	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
4-Methyl-2-pentanone	50	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
Acetone	100	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
Acrolein	--	mg/kg	< 7.380	< 30.700	< 5.890	< 7.290	< 6.250
Acrylonitrile	1	mg/kg	< 3.690	< 15.400	< 2.950	< 3.640	< 3.130
Benzene	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
Bromodichloromethane	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
Bromoform	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
Bromomethane	1	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
Carbon disulfide	--	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
Carbon Tetrachloride	1	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
Chlorobenzene	1	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
Chloroethane	--	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
Chloroform	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
Chloromethane	10	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
Dibromochloromethane	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
Ethyl benzene	100	mg/kg	< 0.738	1.730 J	< 0.589	< 0.729	< 0.625
Methylene Chloride	1	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
Styrene	100	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
Tetrachloroethene	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
Toluene	500	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
Trichloroethene	1	mg/kg	< 0.148	< 0.614	< 0.118	< 0.146	< 0.125
Vinyl Acetate	--	mg/kg	< 1.480	< 6.140	< 1.180	< 1.460	< 1.250
Vinyl Chloride	10	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
Xylenes - Ortho	--	mg/kg	< 0.148	0.645	< 0.118	< 0.146	< 0.125
Xylenes-Meta & Para	--	mg/kg	< 0.295	1.500	< 0.236	< 0.292	< 0.250
cis-1,2-Dichloroethene	1	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
cis-1,3-Dichloropropene	1	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
trans-1,2-Dichloroethene	50	mg/kg	< 0.295	< 1.230	< 0.236	< 0.292	< 0.250
trans-1,3-Dichloropropene	1	mg/kg	< 0.738	< 3.070	< 0.589	< 0.729	< 0.625
Miscellaneous							
Total Solids Percent	--	%	84.64%	82.35%	87.43%		--

Notes:

(1) NJDEP Soil Cleanup Criteria taken from N.J.A.C. 7:26D "Cleanup Standards for Contaminated Sites".

< - Below laboratory detection limit. Detection limit shown.

-- - Not Available

[shaded box] - exceeds NJDEP Soil Cleanup Criteria

mg/kg - milligrams per kilogram

TABLE 2
SUMMARY OF FIELD PARAMETERS [2]
GANES CHEMICALS INC., CARLSTADT, NEW JERSEY

WELL ID	Time	pH	Dissolved Oxygen	Conductivity	Turbidity	Oxidation Reduction Potential	Temperature	Depth to Water	Purge Rate
	minutes	pH units	g/L	s/cm	NTU	mV	°C	ft btoc	ml/min
MW-1	0	6.4	2.1	0.148	140	-24	17.7	15.03	100
	5	6.25	1.41	0.148	990	-20	17.8	15.05	400
	10	6.23	1	0.143	360	-22	19.2	15.05	200
	15	6.23	0.99	0.143	360	-22	19.4	15.06	200
	20	6.23	0.98	0.143	360	-23	19.5	15.03	200
	25	6.23	0.92	0.143	340	-22	20.1	15.03	225
MW-2	0	6.49	2	0.547	53	18	17.8	16.26	200
	5	6.48	1.03	0.548	61	15	17.8	16.26	200
	10	6.47	0.93	0.541	67	8	18.5	16.26	200
	15	6.47	1.02	0.542	56	7	20.8	16.26	200
MW-3	0	6.73	1.31	2.58	32	-117	22.3	11.35	300
	5	6.76	1.33	2.59	47	-118	23	12.7	300
	10	6.78	0.55	2.6	48	-118	22.8	12.7	100
	15	6.78	0.5	2.61	49	-117	22.2	12.71	200
	20	6.79	0.53	2.6	49	-116	21.9	12.7	200
	25	6.79	0.49	2.61	45	-117	21.6	12.7	200
MW-4	0	6.79	3.01	1.8	290	-94	20.9	18.61	200
	5	6.77	1.86	1.81	340	-100	21.2	18.75	100
	10	6.76	0.98	1.84	150	-103	21.1	18.91	250
	15	6.76	1.06	1.83	154	-100	22.1	19	200
	20	6.76	1.05	1.81	140	-105	23.7	19.05	100
MW-4D	0	12.92	5.48	15.7	375	-178	21.1	25.56	300
	5	12.94	4.75	15.6	350	-173	21.6	28.7	200
	10 [1]	12.94	4.72	15.6	318	-170	22.3	30.15	100
MW-6	0	6.65	7.47	0.216	130	178	16.1	18.47	500
	5	6.77	7.29	0.213	120	164	16.2	18.6	300
	10	7.1	6.95	0.207	130	108	18	18.6	300
	15	7.34	7.23	0.219	110	90	19.2	18.6	300
	20	7.36	7.13	0.223	110	88	19.2	18.6	350
	25	7.38	7.16	0.223	100	83	19.2	18.62	400
MW-7	0	7.14	2.27	4.46	[3]	-128	17.4	8.3	600
	5	7.29	0.89	4.47	[3]	-147	19.8	8.77	300
	10	7.31	0.52	4.4	[3]	-152	20.2	8.81	200
	15	7.31	0.56	4.38	[3]	-150	19.9	8.96	100
	20	7.31	0.56	4.33	[3]	-142	17.9	9.01	100
	25	7.31	0.51	4.31	[3]	-141	16.9	9.02	100
MW-8	0	6.92	2.22	0.423	990	13	27.6	12.18	250
	5	6.78	0.88	0.435	990	4	27.3	12.26	300
	10	6.78	0.83	0.436	990	5	27.4	12.31	200
	15	6.76	0.78	0.432	990	-3	29.6	12.51	100
	20	6.76	0.76	0.439	990	-3	28.1	12.65	100
MW-9	0	7.18	2.7	0.97	840	14	19.3	14.57	200
	5	7.14	1.94	0.96	790	20	21	14.66	200
	10	7.14	2.25	0.529	630	23	22.7	14.74	250
	15	7.17	2.74	0.423	280	26	25.4	14.9	100
	20	7.19	2.95	0.393	360	36	24.9	14.92	300
	25	7.17	2.85	0.392	320	39	24.4	14.96	100
	30	7.17	2.77	0.393	330	40	24.7	14.96	100

Notes:

[1] insufficient water column to continue purging

[2] field parameters recorded during low-flow purging. Note: due to the installation schedule, field parameters were not analyzed for MW-10

[3] error in turbidity

TABLE 3
GROUNDWATER ELEVATIONS
GANES CHEMICALS INC., CARLSTADT, NEW JERSEY

WELL ID	TOP OF CASING ELEVATION	DEPTH TO GROUND WATER	FREE PRODUCT THICKNESS	GROUND WATER ELEVATION	DEPTH TO GROUND WATER	FREE PRODUCT THICKNESS	GROUND WATER ELEVATION
		22-Jun-99			**11-Nov-99**		
MW-1	73.94	15.08	- -	58.86	15.03	- -	58.91
MW-2	75.67	15.25	- -	60.42	16.26	- -	59.41
MW-3	88.25	10.98	- -	77.27	11.35	- -	76.90
MW-4	91.15	14.62	- -	76.53	18.60	- -	72.55
MW-4D		--	- -	(1)	25.56	- -	-25.56
MW-5	95.58	18.27	- -	77.31	--	- -	(2)
MW-6	82.59	15.45	- -	67.14	18.47	- -	64.12
MW-7		--	- -	(1)	8.30	- -	-8.30
MW-8		--	- -	(1)	11.81	- -	-11.81
MW-9		--	--	(1)	14.41		-14.41
MW-10		--	- -	(1)	--	- -	(1)

Notes:

(1) Wells not currently installed
(2) No water present

TAB[illegible]
SUM[illegible] OF GROUNDWATER ANALYTICAL RESULTS
GANES CHEMICALS INC., CARLSTADT, NEW JERSEY

Well ID/Sample ID	(1) NJDEP Groundwater Cleanup Criteria		MW-1	MW-2	MW-3	MW-4	MW-4D	MW-4D	MW-6	MW-7	MW-8	MW-9	MW-10	MW-X	B-11/2/9	TB
Date Sampled			11/2/99	11/2/99	11/2/99	11/2/99	11/3/99	12/21/99	11/2/99	11/3/99	11/3/99	11/3/99	12/21/99	11/2/99	11/2/99	11/2/99
Date Analyzed			11/4/99	11/4/99	11/4/99	11/4/99	11/10/99	12/28/99	11/4/99	11/9/99	11/9/99	11/10/99	12/28/99	11/4/99	11/4/99	11/4/99
Laboratory ID		Units	203913A	203912A	203914A	203917A	204137A	L607623	203911A	204134A	204136A	204135A	L607623	203915	20391B	203916
Volatile Organic Compounds (VOCs)																
1,1,1,-Trichloroethane	30	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	<50.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<10.0	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	2	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	<50.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<10.0	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	3	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	<50.0	<2.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	70	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	<50.0	<5.0	< 0.5	< 12.0	< 0.5	< 1.0	<50.0	< 0.5	< 0.5	< 0.5
1,1-Dichloroethene	2	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	<50.0	<2.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	2	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	<50.0	<2.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	1	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	<50.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<10.0	< 0.5	< 0.5	< 0.5
2-Butanone	- -	ug/L	< 5.0	< 5.0	< 5.0	< 50,000	< 500.0	<10.0	< 5.0	< 120.0	< 5.0	< 12.0	<100.0	< 5.0	< 5.0	< 5.0
2-Hexanone	- -	ug/L	< 5.0	< 5.0	< 5.0	< 50,000	< 500.0	<10.0	< 5.0	< 120.0	< 5.0	< 12.0	<100.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-Pentanone	400	ug/L	< 5.0	< 5.0	< 5.0	< 50,000	< 500.0	38.3	< 5.0	350.0	< 5.0	< 12.0	882.0	< 5.0	< 5.0	< 5.0
Acetone	700	ug/L	< 5.0	< 5.0	< 5.0	< 50,000	600.0	<5.0	< 5.0	100 J	13.0	74.0	<50.0	< 5.0	< 5.0	< 5.0
Benzene	1	ug/L	4.0	< 0.5	0.9	< 5,000	< 50.0	5.1	< 0.5	< 12.0	1.0	< 1.0	<50.0	4.0	< 5.0	< 5.0
Bromodichloromethane	1	ug/L	< 0.5	< 0.5	< 5.0	< 5,000	< 50.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<10.0	4.0	< 0.5	< 0.5
Bromoform	4	ug/L	< 1.0	< 1.0	< 1.0	< 10,000	< 100.0	<1.0	< 1.0	< 25.0	< 0.5	< 1.0	<10.0	< 0.5	< 0.5	< 0.5
Bromomethane	- -	ug/L	< 1.0	< 1.0	< 1.0	< 10,000	< 100.0	<10.0	< 1.0	< 25.0	< 1.0	< 2.0	<10.0	< 1.0	< 1.0	< 1.0
Carbon Disulfide	- -	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<10.0	< 1.0	< 25.0	< 1.0	< 2.0	<100.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	2	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<10.0	< 0.5	< 12.0	< 0.5	< 1.0	<100.0	< 0.5	< 0.5	< 0.5
Chlorobenzene	4	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<2.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 0.5	< 0.5	< 0.5
Chloroethane	- -	ug/L	< 1.0	< 1.0	< 1.0	< 10,000	< 100.0	<2.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 0.5	< 0.5	< 0.5
Chloroform	6	ug/L	< 0.5	0.6	< 0.5	< 5,000	< 50.0	<10.0	< 1.0	< 25.0	< 1.0	< 2.0	<100.0	< 1.0	< 1.0	< 1.0
Chloromethane	- -	ug/L	< 1.0	< 1.0	< 1.0	< 10,000	<10.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<10.0	< 0.5	< 0.5	< 0.5
Dibromochloromethane	10	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<10.0	< 1.0	< 25.0	< 1.0	< 2.0	<100.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	700	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<10.0	< 0.5	< 0.5	< 0.5
Methyl-t-butyl Ether	- -	ug/L	< 0.5	< 0.5	2.0	< 5,000	< 50.0	23.7	< 0.5	< 12.0	1.0	< 1.0	44.2J	< 0.5	< 0.5	< 0.5
Methylene Chloride	2	ug/L	< 1.0 B	< 1.0 B	< 1.0 B	10,000 JB	100 JB	1.37J	< 1.0B	45 B	< 1.0 B	3 B	<100.0	< 0.5	< 0.5	< 0.5
Styrene	100	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<5.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 1.0 B	0.8 JB	1.0 B
Tetrachloroethene	1	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<50.0	< 0.5	< 0.5	< 0.5
Toluene	1,000	ug/L	< 0.5	< 0.5	0.5 J	250,000	3,200	210.0	< 0.5	25.0	6.0	14.0	15.0J	< 0.5	< 0.5	< 0.5
Trichloroethene	1	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<1.0	< 0.5	< 12.0	< 0.5	< 1.0	<10.0	< 0.5	< 0.5	< 0.5
Vinyl Chloride	5	ug/L	< 1.0	< 1.0	< 1.0	< 10,000	< 100.0	<5.0	< 1.0	< 25.0	< 1.0	< 2.0	<50.0	< 1.0	< 1.0	< 1.0
Xylenes-Meta&Para	40	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	73.1	< 0.5	< 12.0	1.0	< 1.0	160.0	< 0.5	< 0.5	< 0.5
Xylenes-Ortho	40	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	43.1	< 0.5	< 12.0	0.6	< 1.0	91.3	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene	10	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<2.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	--	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<5.0	< 0.5	< 12.0	< 0.5	< 1.0	<50.0	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	100	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<2.0	< 0.5	< 12.0	< 0.5	< 1.0	<20.0	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropen	--	ug/L	< 0.5	< 0.5	< 0.5	< 5,000	< 50.0	<5.0	< 0.5	< 12.0	< 0.5	< 1.0	<50.0	< 0.5	< 0.5	< 0.5

Notes:

(1) NJDEP Groundwater Cleanup Criteria taken from N.J.A.C. 7:9-6 Table 1 "Specific Ground Water Quality Criteria -ClassIIA and Practicle Quantitation Levels".
< - Below laboratory detection limit. Detection limit shown.
-- - Not Available

- exceeds NJDEP Groundwater Cleanup Criteria

MW-X is a duplicate sample of MW-1.

ug/L - micrograms per liter

B - detected in method blank

TABLE 4
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
GANES CHEMICALS INC.
CARLSTADT, NEW JERSEY

Well ID/Sample ID Date Sampled Laboratory ID	(1) NJDEP Groundwater Criteria	Units	MW-1 11/2/99 203913 (B-E)	MW-2 11/2/99 203912 (B-E)	MW-3 11/2/99 203914 (B-E)	MW-4 11/2/99 203917 (B-E)	MW-4D 11/3/99 204137 (B-E)	MW-6 11/2/99 203911(B-E)	MW-7 11/3/99 204134 (B-E)	MW-8 11/3/99 204136 (B-E)	MW-9 11/3/99 204135 (B-E)
SEMI-VOLATILES											
Methane	--	ug/L	< 20.0	< 20.0	430.0	3400.0	< 20.0	< 20.0	820.0	< 20.0	< 20.0
DISSOLVED METALS											
Iron - Dissolved	0.3	mg/L	28.00	11.00	8.70	3.10	0.20	< 0.05	2.10	0.26	< 0.05
Manganese - Dissolved	0.05	mg/L	3.40	11.00	7.40	4.50	0.03	< 0.01	0.72	2.00	1.40
MISCELLANEOUS PARAMETERS											
Nitrogen - NO3-N	10	mg/L	0.2	< 0.1	< 0.1	< 0.1	0.4	3.7	< 0.1	< 0.1	0.6
Biochemical Oxygen Demand (BOD)	--	mg/L	10.0	12.0	24.0	420.0	< 6.0	< 6.0	20.0	29.0	12.0
Alkalinity as $CaCO_3$	--	mg/L	70.0	250.0	530.0	510.0	1860.0	110.0	610.0	150.0	140.0
Sulfate	250	mg/L	30.0	80.0	540.0	22.0	870.0	34.0	700.0	53.0	37.0
Total Dissolved Solids (TDS)	10	mg/L	160.0	560.0	1600.0	1200.0	3800.0	290.0	2700.0	430.0	460.0
Total Organic Carbon (TOC)	--	mg/L	2.0	2.1	8.5	15.0	24.0	0.6	11.0	20.0	2.9
Chemical Oxygen Demand (COD)	--	mg/L	< 20.0	24.0	99.0	450.0	81.0	< 20.0	86.0	100.0	32.0

Notes:

(1) NJDEP Groundwater Cleanup Criteria taken from N.J.A.C. 7:9-6 Table 1 "Specific Ground Water Quality Criteria -ClassIIA and Practicle Quantitation Levels".
< - Below laboratory detection limit. Detection limit shown.
-- Not Available
ug/L - micrograms per liter
mg/L - milligrams per liter
[shaded] - exceeds NJDEP Groundwater Cleanup Criteria

Appendix A

Soil Borehole Logs

SOIL DRILLING LOG

McLaren Hart

SB/MW #: MW-4D
D-
Page 1 of 2
Geologist: A. Schwendt/C. Phillips

SIGNATURE OF GEOLOGIST

PROJECT Ganes Chemicals, Inc. LOCATION Carlstadt, New Jersey
TOC ELEVATION (MSL) DATE(S) 10/14/99 10/15/99 TOTAL DEPTH 60.0'
MONITORING DEVICE OVM SCREENED INTERVAL
SAMPLING METHOD NA SUBCONTRACTOR & EQPT Advanced Drilling, Inc/HSA/Mud Rotary
PERCENTAGE ORDER: (GRAVEL,SAND,SILT,CLAY) MEMO ∇ = First Water ▼ = Static Water
MEMO

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"-6"	BPF	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Borehole Abandonment/ Well Construction Details
					0	0.0' - 0.5' Concrete			Traffic Rated Vault Box
2.0 – 22.0						0.5' - 22.0' Reddish-brown gravelly sand with cobbles. Soft and loose. Mild petroleum odors noticed in soil cuttings after 15' b.g..	SW		
22.0					0	22.0' - 26.0' MUD ROTARY ADVANCED. Competent bedrock. Fractures between 24'-26' b.g. Large fracture at 24.5' b.g. Mild petroleum odors in soil cuttings.			
26.0						26.0' - 27.0' MUD ROTARY ADVANCED. Sand and gravel.	SW		
27.0 – 30.0						27.0' - 60.0' MUD ROTARY ADVANCED. Competent bedrock. Fractures at 38.5' b.g.			
						Continued			

Depth scale: 2.0, 4.0, 6.0, 8.0, 10.0, 12.0, 14.0, 16.0, 18.0, 20.0, 22.0, 24.0, 26.0, 28.0, 30.0

SIGNATURE OF FIELD SUPERVISOR AND REVIEWER
Paul Michaels
TITLE

SIGNATURE OF REVIEWER
Axel Schwendt
TITLE

SOIL DRILLING LOG

SB/MW #: MW-4D
D-

Geologist: A. Schwendt/C. Phillips

McLaren Hart

SIGNATURE OF GEOLOGIST

PROJECT Ganes Chemicals, Inc. LOCATION Carlstadt, New Jersey

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"-6"	Penetration Results: BPF	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Borehole Abandonment/ Well Construction Details
30.0									
32.0									
34.0									
36.0									
38.0									
40.0									
42.0									
44.0									
46.0									
48.0									
50.0									
52.0									
54.0									
56.0									
58.0									
60.0									

SIGNATURE OF FIELD SUPERVISOR AND REVIEWER
Paul Michaels
TITLE

SIGNATURE OF REVIEWER
Axel Schwendt
TITLE

SOIL DRILLING LOG

SB/MW #: MW-7
D-
Page 1 of 1
Geologist: A. Schwendt/C. Phillips

SIGNATURE OF GEOLOGIST

McLaren Hart

PROJECT Ganes Chemicals, Inc. LOCATION Carlstadt, New Jersey
TOC ELEVATION ______ (MSL) DATE(S) 10/13/99 10/13/99 TOTAL DEPTH 20.0'
MONITORING DEVICE OVM SCREENED INTERVAL
SAMPLING METHOD Split Spoon SUBCONTRACTOR & EQPT Advanced Drilling, Inc./HSA/Mud Rotary
PERCENTAGE ORDER: (GRAVEL,SAND,SILT,CLAY) MEMO ∇ = First Water ▼ = Static Water
MEMO

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"-6"	BPF	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Borehole Abandonment/ Well Construction Details
					0	0.0' - 0.5' Concrete			Traffic Rated Vault Box
2.0						0.5' - 13.0' Reddish-brown sandy silt, trace gravel and clay. Medium stiff. Black Staining between 11'-12' b.g. No odors. Groundwater at 12' b.g.	ML		
4.0									
6.0	17-20-20-22				0				
8.0 ▼	16-19-22-20				0				
10.0	16-29-30-30			MW-7	0				
12.0 ∇	100/5				0				
14.0					0	13.0' - 20.0' MUD ROTARY ADVANCED. Sand and gravel; cobbles.			
16.0									
18.0									
20.0									

SIGNATURE OF FIELD SUPERVISOR AND REVIEWER
Paul Michaels
TITLE

SIGNATURE OF REVIEWER
Axel Schwendt
TITLE

SOIL DRILLING LOG

McLaren Hart

SB/MW #: MW-8
D-
Page 1 of 1
Geologist: A. Schwendt/C. Phillips

SIGNATURE OF GEOLOGIST

PROJECT Ganes Chemicals, Inc. LOCATION Carlstadt, New Jersey
TOC ELEVATION ______ (MSL) DATE(S) 10/12/99 10/12/99 TOTAL DEPTH 22.0'
MONITORING DEVICE OVM SCREENED INTERVAL
SAMPLING METHOD Split Spoon SUBCONTRACTOR & EQPT Advanced Drilling, Inc./HSA/Mud Rotary
PERCENTAGE ORDER: (GRAVEL,SAND,SILT,CLAY) MEMO ▽ = First Water ▼ = Static Water
MEMO

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"-6"	BPF	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Borehole Abandonment/ Well Construction Details
					0	0.0' - 0.5' Concrete			Traffic Rated Vault Box
	15-50/5				0	0.5' - 8.0' MUD ROTARY ADVANCED.	SW		
					0	Reddish-brown gravelly sand			
2.0									
4.0									
6.0									
8.0	28-30-28-39			MW-8	98.5	8.0' - 9.7' Reddish-brown gravelly sand; trace silt. Stiff and damp. No stains and no odors.	SP		
▽									
10.0					0	Groundwater at 9' b.g. Refusal at 9.7.			
						9.7' - 22.0' MUD ROTARY ADVANCED. Sand and gravel; cobbles.			
▼ 12.0									
14.0									
16.0									
18.0									
20.0									
22.0									

SIGNATURE OF FIELD SUPERVISOR AND REVIEWER
Paul Michaels
TITLE

SIGNATURE OF REVIEWER
Axel Schwendt
TITLE

SOIL DRILLING LOG

McLaren Hart

SB/MW #: MW-9
D-
Page 1 of 1
Geologist: A. Schwendt/C. Phillips

SIGNATURE OF GEOLOGIST

PROJECT Ganes Chemicals, Inc. LOCATION Carlstadt, New Jersey
TOC ELEVATION ____ (MSL) DATE(S) 10/13/99 10/13/99 TOTAL DEPTH 24.0'
MONITORING DEVICE OVM SCREENED INTERVAL
SAMPLING METHOD Split Spoon SUBCONTRACTOR & EQPT Advanced Drilling, Inc./HSA/Mud Rotary
PERCENTAGE ORDER: (GRAVEL,SAND,SILT,CLAY) MEMO ▽ = First Water ▼ = Static Water
MEMO

Depth Below Surface (ft.)	Penetration Results: Blows 6"-6"-6"-6"	BPF	Sampler Interval/ Recovery	Sample ID #	PID reading (ppm)	Soil Description Color, Texture, Moisture, Etc.	Unified Classification	Graphic Log	Borehole Abandonment/ Well Construction Details
					0	0.0' - 0.5' Concrete			Traffic Rated Vault Box
2.0						0.5' - 10.0' Reddish-brown sandy silt, trace clay and gravel. Medium stiff and dry. No stains and no odors.	ML		
4.0	12-17-17-18				0				
6.0	22-13-20-21				0				
8.0	20-18-17-19				0				
10.0	29-28-29-30				0	10.0' - 12.0' Reddish-brown clayey-silt and clayey-sand; trace gravel. Medium stiff and dry. No stains and no odors.	ML		
12.0	27-38-40-63				0	12.0' - 17.0' Reddish-brown silt and silty-sand; trace clay and sandy silt. Medium stiff and damp. No stains and no odors. Groundwater at 17' b.g.	ML		
14.0 ▼					0				
16.0	29-21-35-43			MW-9	0				
▽ 18.0					0	17.0' - 24.0' MUD ROTARY ADVANCED. Sand and gravel; cobbles.			
20.0									
22.0									
24.0									

SIGNATURE OF FIELD SUPERVISOR AND REVIEWER
Paul Michaels
TITLE

SIGNATURE OF REVIEWER
Axel Schwendt
TITLE

Boring / Well: MW-10	Site: Ganes Chemical		
	Location: Carlstadt , New Jersey		
NJ Permit No.:	Ground Elev (ft):	TOC Elev (ft):	Vertical Datum:
Project Number:	X Coord:	Y Coord:	Coor Syst:
Site Name: Ganes Chemical	Total Depth (ft): 29.5	Depth to GW below gs (ft): 14.6	
Dates: 12/20/99 -	Surface Well Construction:		
Drilling Contractor: Advanced Drilling	Casing:		
Drilling Method: Hollow-Stem Auger			
Logged By: Axel Schwendt	Annular Fill:		
Memo:	Screen:		

Depth (ft)	Sample	Recovery	Soil Description	Lithology	Sample Analysis	PID (ppm)	Visual Observations	Odor	Sample Interval/ Rationale	Well Construction Diagram
2			Firm. Brown Sandy SILT, with trace clay., (ML). Dry.				None	None		
4			Firm. Orange-brown Sandy SILT, with trace clay., (ML).			0	None	None		
6			Firm. Orange-brown Sandy SILT, with trace clay., (ML).			0	None	None		
8			Firm. Orange-brown Sandy SILT, with trace clay., (ML).				None	None		
			Firm. Orange-brown Sandy SILT, with trace clay., (ML).			0				

KINGOFPRUS GAINES.GPJ MH_LES.GDT 3/14/00

Boring / Well:	Site:
MW-10	Ganes Chemical
	Location: Carlstadt , New Jersey

Depth (ft)	Sample	Recovery	Soil Description	Lithology	Sample Analysis	PID (ppm)	Visual Observations	Odor	Sample Interval/ Rationale	Well Construction Diagram
							None	None		
12			Firm. Orange-brown Sandy SILT, with trace clay., (ML).				None	None	MW-10,	
14			Firm. Orange-brown Sandy SILT, with trace clay., (ML).			0	None	None		∇
16			Firm. Orange-brown Sandy SILT, with trace clay., (ML).				None	None		
			Firm. Orange-brown Sandy SILT, with trace clay., (ML).							
18			AUGER ADVANCED TO 29.5'.,							
20										
22										

Boring / Well:	Site:
MW-10	Ganes Chemical
	Location: Carlstadt , New Jersey

Depth (ft)	Sample	Recovery	Soil Description	Lithology	Sample Analysis	PID (ppm)	Visual Observations	Odor	Sample Interval/ Rationale	Well Construction Diagram
24										
26										
28										
30										
32										
34										
36										

Appendix B

Soil Sample Analytical Data Sheets

QC Laboratories

Analytical Results

12/08/99 09:14am

Regarding:

AXEL SCHWENDT
MCLAREN HART
470 NORRISTOWN ROAD
SUITE 300
BLUE BELL, PA 19422

AXEL SCHWENDT
MCLAREN HART
470 NORRISTOWN ROAD
SUITE 300
BLUE BELL, PA 19422

Account No: E00233, MCLAREN HART PA
Project No: E00233, MCLAREN HART PA

P.O. No:
PWSID No:

Inv. No: 251337

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-1	GANES CHEMICALS 119698 MW-8 (8.5-9.0)	10/12/99 01:00pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
CHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
VINYL CHLORIDE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
BROMOMETHANE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
CHLOROETHANE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
1,1-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
ACETONE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
CARBON DISULFIDE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
METHYLENE CHLORIDE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
TRANS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
ACROLEIN	EPA Method 8260	ND ug/kg DRY	30700 ug/kg	10/25/99
ACRYLONITRILE	EPA Method 8260	ND ug/kg DRY	15400 ug/kg	10/25/99
1,1-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
VINYL ACETATE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
CIS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
2-BUTANONE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
CHLOROFORM	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
1,1,1-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
CARBON TETRACHLORIDE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
BENZENE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
1,2-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
TRICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
1,2-DICHLOROPROPANE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
BROMODICHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
2-CHLOROETHYL VINYL ETHER	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
CIS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
4-METHYL-2-PENTANONE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
TOLUENE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
TRANS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
1,1,2-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
TETRACHLOROETHENE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
2-HEXANONE	EPA Method 8260	ND ug/kg DRY	6140 ug/kg	10/25/99
DIBROMOCHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
CHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	1230 ug/kg	10/25/99
ETHYL BENZENE	EPA Method 8260	1730 J ug/kg DRY	3070 ug/kg	10/25/99
M&P-XYLENES	EPA Method 8260	1500 ug/kg DRY	1230 ug/kg	10/25/99
O-XYLENE	EPA Method 8260	645. ug/kg DRY	614. ug/kg	10/25/99
STYRENE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
BROMOFORM	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99
1,1,2,2-TETRACHLOROETHANE	EPA Method 8260	ND ug/kg DRY	614. ug/kg	10/25/99

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are; PADER 09-131;NJDEP 77166/77001(WindGap), additional states upon request.
Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident;
TNTC=too numerous to count

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

Allen D. Schopbach

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

QC Laboratories

Analytical Results

12/08/99 09:14am

Account No: E00233, MCLAREN HART PA
Project No: E00233, MCLAREN HART PA

P.O. No:
PWSID No:

Inv. No: 251337

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-1	GANES CHEMICALS 119698 MW-8 (8.5-9.0)	10/12/99 01:00pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
1,3-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
1,4-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
1,2-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	3070 ug/kg	10/25/99
TOTAL SOLIDS PERCENT	STD Methods 18th Ed. 2540	82.35 %	0.01000 %	10/22/99

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-2	SS-S-ISOTECH	10/12/99 01:00pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
IRON	SW846 Method 6010	10400 mg/kg DRY	6.29 mg/kg	10/19/99
TOTAL ORGANIC CARBON	EPA 600 Method 415.1	ATTACHED		
TOTAL SOLIDS PERCENT	STD Methods 18th Ed. 2540	79.46 %	0.01000 %	10/22/99

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-3	119695 MW-7 (11.5-12.0)	10/12/99 10:30am NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
CHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
VINYL CHLORIDE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
BROMOMETHANE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
CHLOROETHANE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
1,1-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
ACETONE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
CARBON DISULFIDE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
[illegible]THYLENE CHLORIDE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
[illegible]ANS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
[illegible]OLEIN	EPA Method 8260	ND ug/kg DRY	7380 ug/kg	10/26/99
[illegible]LONITRILE	EPA Method 8260	ND ug/kg DRY	3690 ug/kg	10/26/99
[illegible]1-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
VINYL ACETATE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
CIS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
2-BUTANONE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
CHLOROFORM	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
1,1,1-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
CARBON TETRACHLORIDE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
BENZENE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
1,2-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
TRICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
1,2-DICHLOROPROPANE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
BROMODICHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
2-CHLOROETHYL VINYL ETHER	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
CIS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
4-METHYL-2-PENTANONE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
TOLUENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
TRANS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
1,1,2-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
TETRACHLOROETHENE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
2-HEXANONE	EPA Method 8260	ND ug/kg DRY	1480 ug/kg	10/26/99
DIBROMOCHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
CHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are; PADER 09-131;NJDEP 77166/77001(WindGap), additional states upon request.
Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

QC Laboratories

Analytical Results

12/08/99 09:14am

Account No: E00233, MCLAREN HART PA
Project No: E00233, MCLAREN HART PA

P.O. No:
PWSID No:

Inv. No: 251337

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-3	119695 MW-7 (11.5-12.0)	10/12/99 10:30am NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
ETHYL BENZENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
M&P-XYLENES	EPA Method 8260	ND ug/kg DRY	295. ug/kg	10/26/99
O-XYLENE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
STYRENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
BROMOFORM	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
1,1,2,2-TETRACHLOROETHANE	EPA Method 8260	ND ug/kg DRY	148. ug/kg	10/26/99
1,3-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
1,4-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
1,2-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	738. ug/kg	10/26/99
TOTAL SOLIDS PERCENT	STD Methods 18th Ed. 2540	84.64 %	0.01000 %	10/22/99

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-4	119696 MW-9 (16.5-17.0)	10/12/99 04:15pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
CHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
VINYL CHLORIDE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
BROMOMETHANE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
CHLOROETHANE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
1,1-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
ACETONE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
CARBON DISULFIDE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
METHYLENE CHLORIDE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
TRANS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
ACROLEIN	EPA Method 8260	ND ug/kg DRY	5890 ug/kg	10/26/99
ACRYLONITRILE	EPA Method 8260	ND ug/kg DRY	2950 ug/kg	10/26/99
1,1-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
VINYL ACETATE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
CIS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
2-BUTANONE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
CHLOROFORM	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
1,1,1-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
CARBON TETRACHLORIDE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
BENZENE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
1,2-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
TRICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
1,2-DICHLOROPROPANE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
BROMODICHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
2-CHLOROETHYL VINYL ETHER	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
CIS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
4-METHYL-2-PENTANONE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
TOLUENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
TRANS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
1,1,2-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
TETRACHLOROETHENE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
2-HEXANONE	EPA Method 8260	ND ug/kg DRY	1180 ug/kg	10/26/99
DIBROMOCHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
CHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99
ETHYL BENZENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
M&P-XYLENES	EPA Method 8260	ND ug/kg DRY	236. ug/kg	10/26/99

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are; PADER 09-131;NJDEP 77166/77001(WindGap); additional states upon request.
Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

QC Laboratories

Analytical Results

12/08/99 09:14am

Account No: E00233, MCLAREN HART PA
Project No: E00233, MCLAREN HART PA

P.O. No:
PWSID No:

Inv. No: 251337

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-4	119696 MW-9 (16.5-17.0)	10/12/99 04:15pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
O-XYLENE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
STYRENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
BROMOFORM	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
1,1,2,2-TETRACHLOROETHANE	EPA Method 8260	ND ug/kg DRY	118. ug/kg	10/26/99
1,3-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
1,4-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
1,2-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	589. ug/kg	10/26/99
TOTAL SOLIDS PERCENT	STD Methods 18th Ed. 2540	87.43 %	0.01000 %	10/22/99

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-5	119699 TRIP BLANK	10/12/99 00:00pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
CHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
VINYL CHLORIDE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
BROMOMETHANE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
CHLOROETHANE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
1,1-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
ACETONE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
CARBON DISULFIDE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
METHYLENE CHLORIDE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
TRANS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
ACROLEIN	EPA Method 8260	ND ug/kg DRY	6250 ug/kg	10/25/99
ACRYLONITRILE	EPA Method 8260	ND ug/kg DRY	3130 ug/kg	10/25/99
1.1-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
NYL ACETATE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
S-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
UTANONE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
LOROFORM	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
1,1,1-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
CARBON TETRACHLORIDE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
BENZENE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
1,2-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
TRICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
1,2-DICHLOROPROPANE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
BROMODICHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
2-CHLOROETHYL VINYL ETHER	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
CIS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
4-METHYL-2-PENTANONE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
TOLUENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
TRANS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
1,1,2-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
TETRACHLOROETHENE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
2-HEXANONE	EPA Method 8260	ND ug/kg DRY	1250 ug/kg	10/25/99
DIBROMOCHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
CHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
ETHYL BENZENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
M&P-XYLENES	EPA Method 8260	ND ug/kg DRY	250. ug/kg	10/25/99
O-XYLENE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
STYRENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are; PADER 09-131;NJDEP 77166/77001(WindGap), additional states upon request.
Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

QC Laboratories

Analytical Results

12/08/99 09:14am

Account No: E00233, MCLAREN HART PA　　P.O. No:　　Inv. No: 251337
Project No: E00233, MCLAREN HART PA　　PWSID No:

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L589348-5	119699 TRIP BLANK	10/12/99 00:00pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
BROMOFORM	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
1,1,2,2-TETRACHLOROETHANE	EPA Method 8260	ND ug/kg DRY	125. ug/kg	10/25/99
1,3-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
1,4-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99
1,2-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	625. ug/kg	10/25/99

L589348-1:

1. QUALIFIERS: "B" is used when the compound is found in the blank as well as in the sample; "J" indicates an estimated value; "E" identifies compounds whose concentrations exceed the range of calibration of the instrument; "N" indicates presumptive evidence of a compound.

2. Sample MW-9 has a weight difference of 12.12 grams outside of the recommended range of 8-12 grams.

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are; PADER 09-131;NJDEP 77166/77001(WindGap), additional states upon request.
Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

QC Laboratories

Analytical Results

01/27/00 09:31am

AXEL SCHWENDT
MCLAREN/HART
470 NORRISTOWN ROAD
SUITE 300
BLUE BELL, PA 19422

Regarding:

AXEL SCHWENDT
MCLAREN/HART
470 NORRISTOWN ROAD
SUITE 300
BLUE BELL, PA 19422

Account No: B00196, MCLAREN/HART PA
Project No: B00196, MCLAREN/HART PA

P.O. No:
PWSID No:

Inv. No: 260326

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L607623-1	GANES 120118 MW-10-11.5-12.0	12/20/99 12:30pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
CHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
VINYL CHLORIDE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
BROMOMETHANE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
CHLOROETHANE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
1,1-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
ACETONE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
CARBON DISULFIDE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
METHYLENE CHLORIDE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
TRANS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
ACROLEIN	EPA Method 8260	ND ug/kg DRY	7290 ug/kg	12/28/99
ACRYLONITRILE	EPA Method 8260	ND ug/kg DRY	3640 ug/kg	12/28/99
1-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
NYL ACETATE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
S-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
UTANONE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
LOROFORM	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
1,1,1-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
CARBON TETRACHLORIDE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
BENZENE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
1,2-DICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
TRICHLOROETHENE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
1,2-DICHLOROPROPANE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
BROMODICHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
2-CHLOROETHYL VINYL ETHER	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
CIS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
4-METHYL-2-PENTANONE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
TOLUENE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
TRANS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
1,1,2-TRICHLOROETHANE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
TETRACHLOROETHENE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
2-HEXANONE	EPA Method 8260	ND ug/kg DRY	1460 ug/kg	12/28/99
DIBROMOCHLOROMETHANE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
CHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
ETHYL BENZENE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
M&P-XYLENES	EPA Method 8260	ND ug/kg DRY	292. ug/kg	12/28/99
O-XYLENE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
STYRENE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
BROMOFORM	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99
1,1,2,2-TETRACHLOROETHANE	EPA Method 8260	ND ug/kg DRY	146. ug/kg	12/28/99

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are: PADER 09-131;NJDEP 77166/77001(WindGap), additional states upon request.
Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count

A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

Allen D. Schopbach, President

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

QC Laboratories

Analytical Results

01/27/00 09:31am

Account No: B00196, MCLAREN/HART PA
Project No: B00196, MCLAREN/HART PA

P.O. No:
PWSID No:

Inv. No: 260326

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L607623-1	GANES 120118 MW-10-11.5-12.0	12/20/99 12:30pm NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
1,3-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
1,4-DICHLOROBENZENE	EPA Method 8260	ND ug/kg DRY	729. ug/kg	12/28/99
1,2-DICHLOROBENZENE	EPA Method 8260	213. J ug/kg DRY	729. ug/kg	12/28/99
NONE FOUND	EPA 8260 Library Search	ND ug/kg		12/28/99
TOTAL SOLIDS PERCENT	STD Methods 18th Ed. 2540	91.25 %	0.01000 %	12/30/99

L607623-1:
1. QUALIFIERS: "B" is used when the compound is found in the blank as well as in the sample; "J" indicates an estimated value; "E" identifies compounds whose concentrations exceed the range of calibration of the instrument; "N" indicates presumptive evidence of a compound.

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are; PADER 09-131;NJDEP 77166/77001(WindGap), additional states upon request.
Definitions: ND-not detected; NEG-negative; POS-positive; COL-colonies; RLs-laboratory reporting limits; L/A-laboratory accident; TNTC-too numerous to count
A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

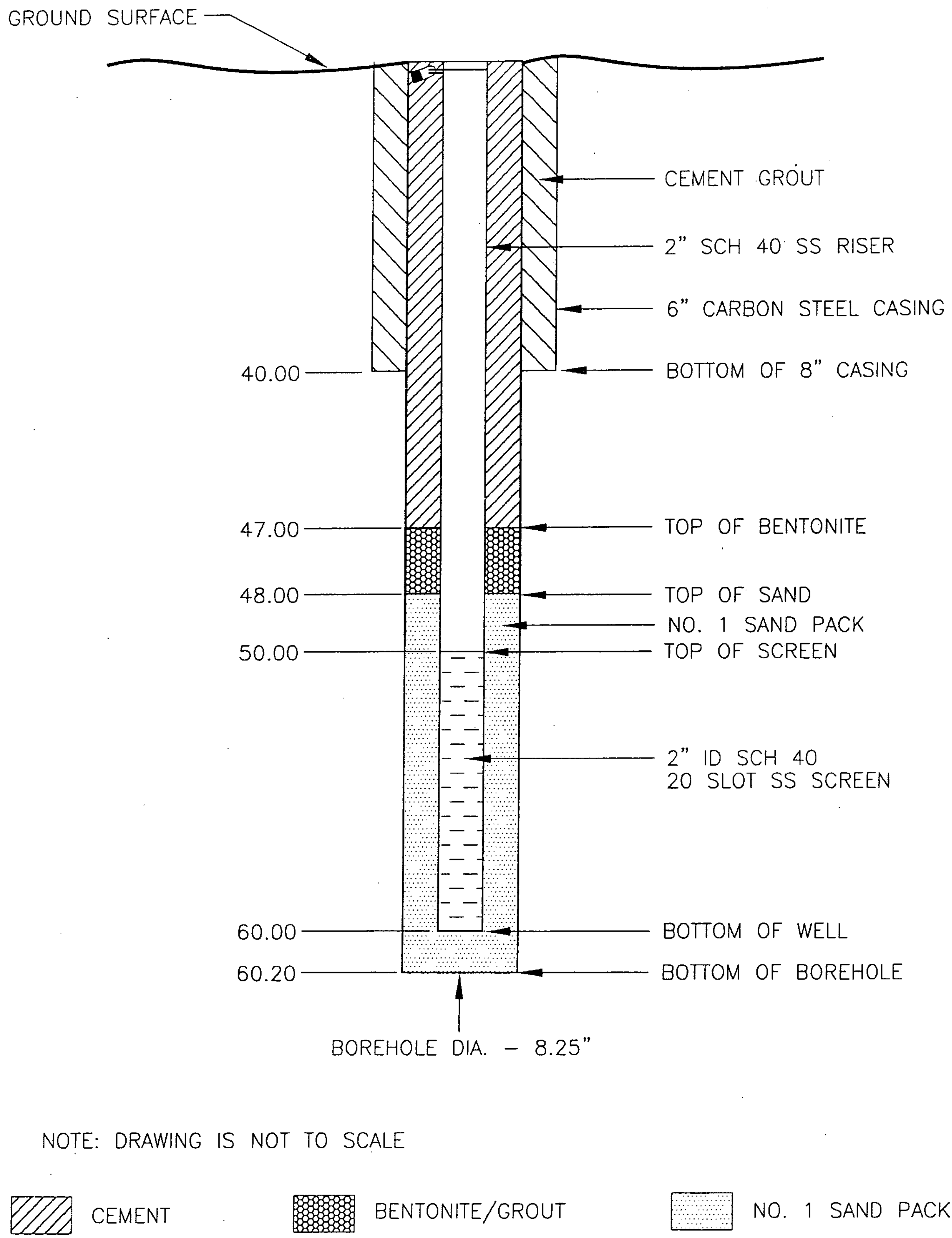
Allen D. Schopbach, President

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

Appendix C

Well Construction Diagrams

FILE NO. 81180309
DATE: 03-16-00
CAD/OP FC

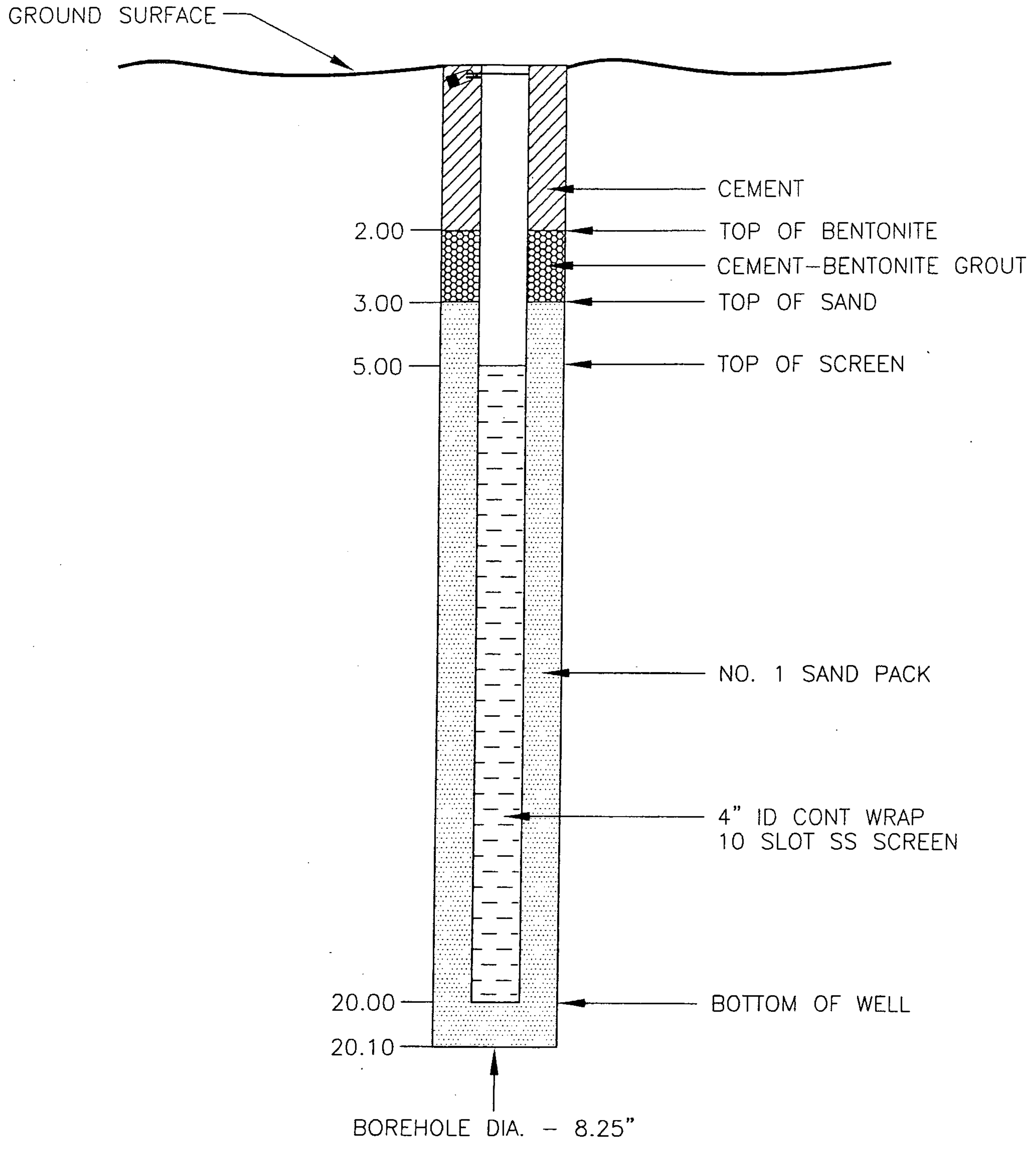


McLaren/Hart, INC.

MONITORING WELL CONSTRUCTION DIAGRAM
MONITORING WELL MW-4D
GANES CHEMICALS, INC.
CARLSTADT, NEW JERSEY

DRWN: FC	SCALE: NONE
CHK'D:	DATE: 12-06-99
APP'D:	**APPENDIX - C**

FILE NO. 61180307
DATE: 03-16-00
CAD/OP FC



NOTE: DRAWING IS NOT TO SCALE

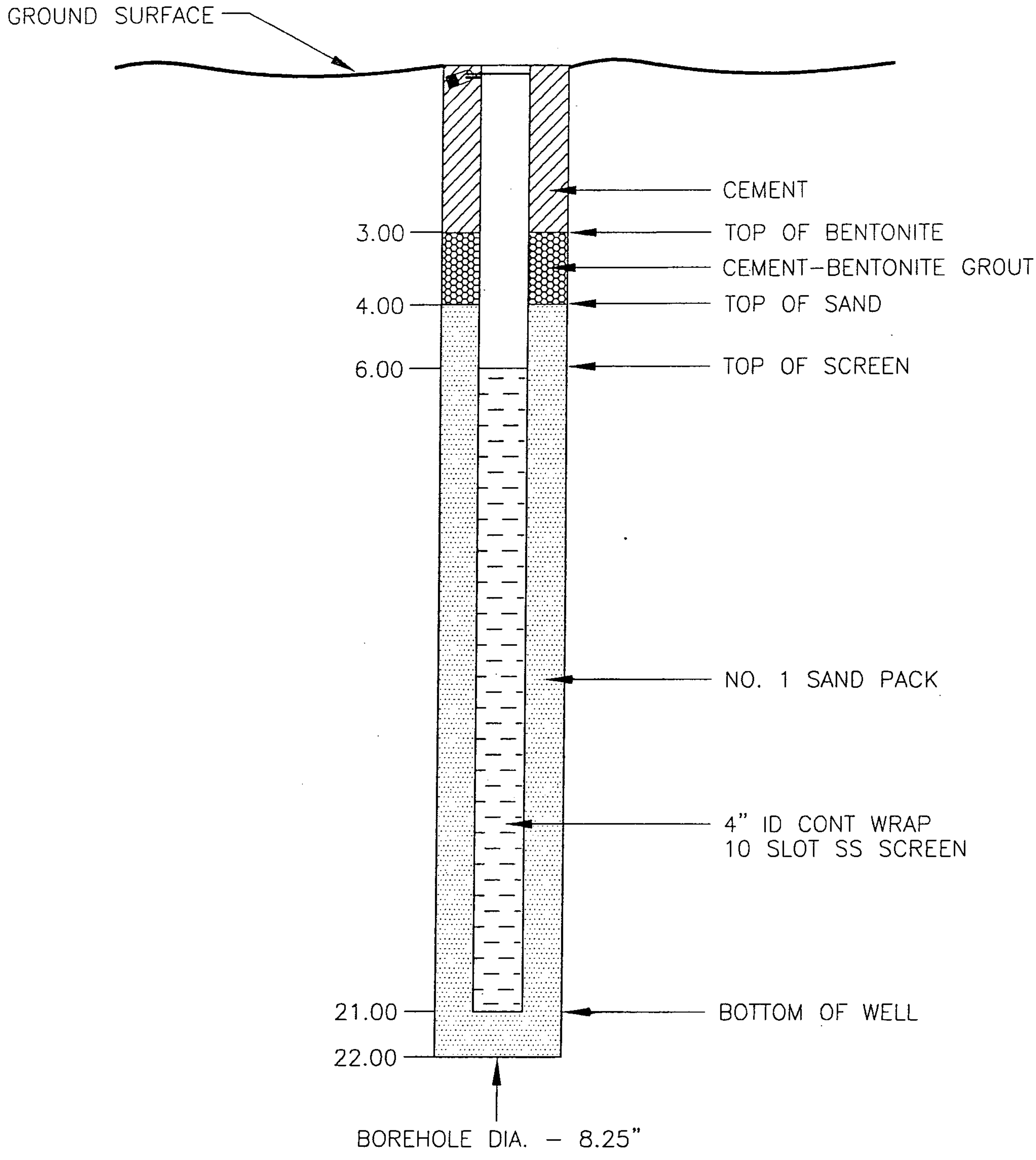
CEMENT | BENTONITE/GROUT | NO. 1 SAND PACK

McLaren Hart, INC.

MONITORING WELL CONSTRUCTION DIAGRAM
MONITORING WELL MW-7
GANES CHEMICALS, INC.
CARLSTADT, NEW JERSEY

DRWN: FC	SCALE: NONE
CHK'D:	DATE: 12-06-99
APP'D:	**APPENDIX - C**

FILE NO. 61180308
DATE: 03-16-00
CAD/OP FC



NOTE: DRAWING IS NOT TO SCALE

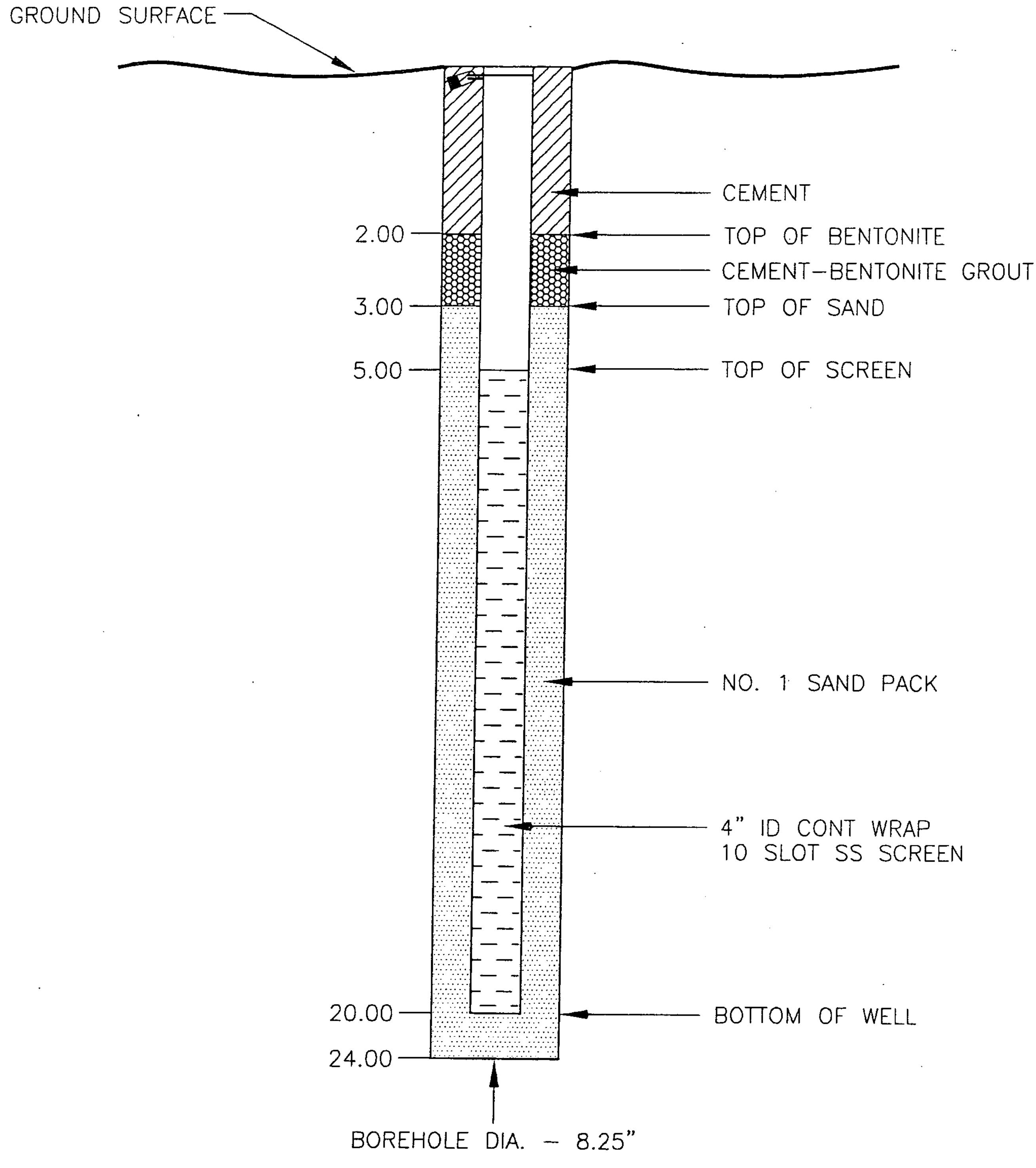
CEMENT BENTONITE/GROUT NO. 1 SAND PACK

McLaren Hart, INC.

MONITORING WELL CONSTRUCTION DIAGRAM
MONITORING WELL MW-8
GANES CHEMICALS, INC.
CARLSTADT, NEW JERSEY

DRWN: FC	SCALE: NONE
CHK'D:	DATE: 12-06-99
APP'D:	**APPENDIX - C**

FILE NO. 61180306
DATE: 03-16-00
CAD/OP FC



NOTE: DRAWING IS NOT TO SCALE

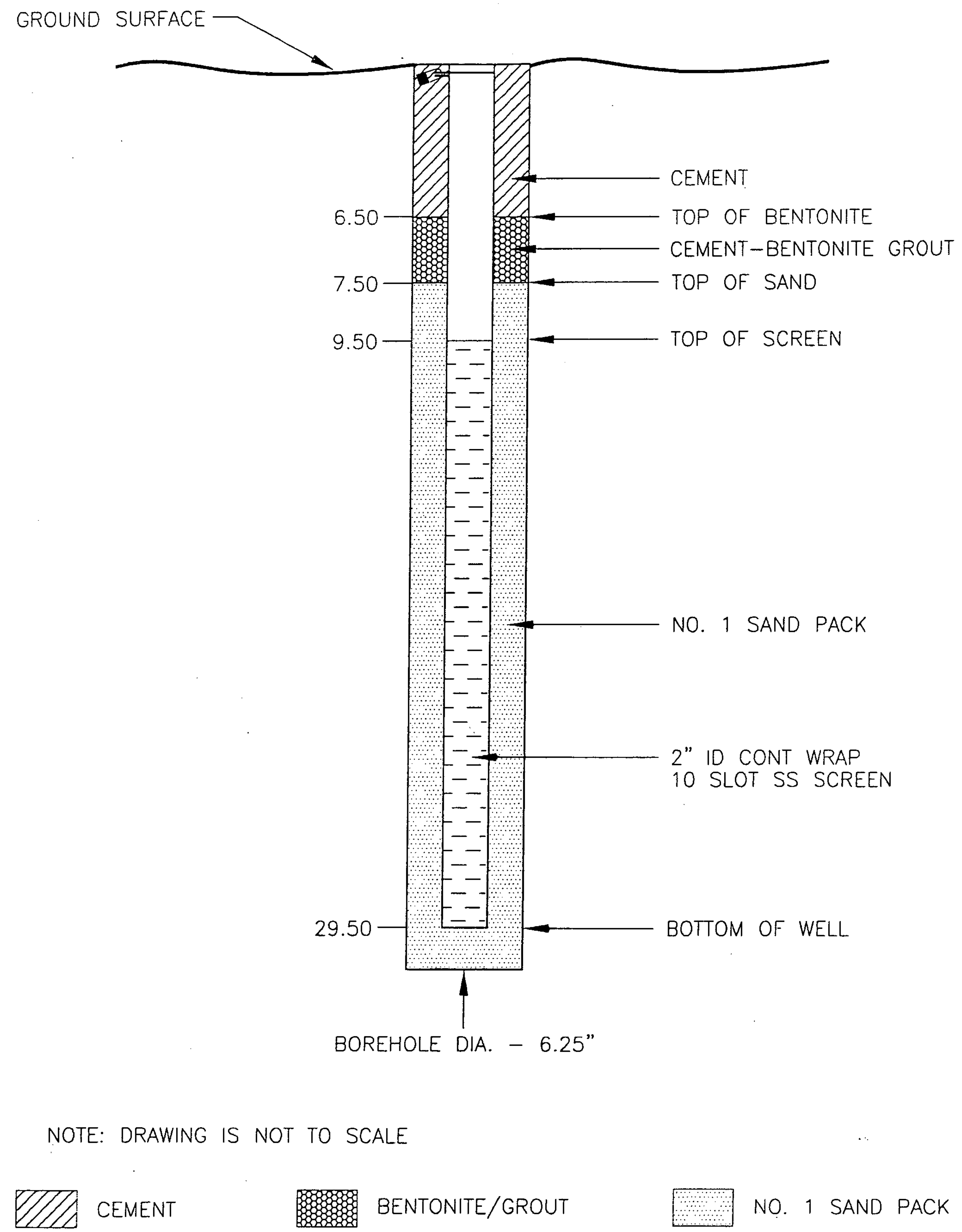
CEMENT BENTONITE/GROUT NO. 1 SAND PACK

McLaren Hart, INC.

MONITORING WELL CONSTRUCTION DIAGRAM
MONITORING WELL MW-9
GANES CHEMICALS, INC.
CARLSTADT, NEW JERSEY

DRWN: FC	SCALE: NONE
CHK'D:	DATE: 12-06-99
APP'D:	**APPENDIX - C**

FILE NO. 61180322
DATE: 03-16-00
CAD/OP FC



McLaren• Hart, INC.

MONITORING WELL CONSTRUCTION DIAGRAM
MONITORING WELL MW-10
GANES CHEMICALS, INC.
CARLSTADT, NEW JERSEY

DRWN: FC	SCALE: NONE
CHK'D:	DATE: 03-15-00
APP'D:	**APPENDIX - C**

Appendix D

Standard Operating Procedure for Low-Flow Groundwater Sampling Technique

STANDARD OPERATING PROCEDURE - LOW-FLOW GROUNDWATER SAMPLING TECHNIQUE

1.0 SCOPE AND APPLICATION

This section presents the procedure for the collection of groundwater samples from monitoring wells using low-flow sampling equipment. The low-flow sampling method enables the collection of samples which are representative of the mobile load of contaminants (dissolved and colloid-associated) and produces minimal disturbance of the sampling point, thereby minimizing sampling artifacts and providing data more representative of actual water quality.

This low flow sampling procedure is a modification of the EPA's March 1998 *Groundwater Sampling Procedure - Low Stress Purging and Sampling.* The purpose of the low-flow purging and sampling procedure is to collect groundwater samples from monitoring wells that are representative of groundwater conditions in the given geologic formation. Advantages achieved by utilizing the low flow minimal drawdown sampling procedure are as follows

- Samples which are representative of the mobile load of contaminants (dissolved and colloid-associated);
- Minimal disturbance of the sampling point, thereby minimizing sampling artifacts and providing data more representative of the actual formation water quality;
- Better sample consistency;
- Less sampler variability;
- Reduced stress on the formation (minimal drawdown);
- Less mixing of stagnant casing water with formation water;
- Minimization of the amount of wastewater produced relative to the conventional 3 to 5 casing volume evacuation process.

Certain situations may be encountered during low-flow sampling that require special consideration. Four such situations, and the appropriate response actions, are described below.

1) Insufficient Yield. Wells with insufficient yield may dewater during purging. To avoid loss of pressure in the tubing line due to dewatering of the well below the level of the pump intake, purging should be interrupted before the water level in the well drops below the top of the pump. Purging the well dry should be avoided to the extent possible. Sampling should commence as soon as the volume in the well has recovered sufficiently to allow collection of samples.

2) Failure to Stabilize Key Indicator Parameters. If one or more key indicator parameters (see below) fails to stabilize after 1 hour of purging, discontinue purging, collect samples and document attempts to reach stabilization in the log book.

3) Cascading. To prevent cascading and/or air-bubble formation in the tubing, care should be taken to ensure that the flow rate is sufficient to maintain pump suction. The length and diameter of tubing should be minimized (e.g. $^1/_4$- or $^3/_8$-inch inside diameter) to ensure that the tubing remains filled with groundwater during sampling.

4) Cross-Contamination. Cross-contamination between wells will be prevented by decontaminating the purging and sampling equipment for each well, and at the start of each sampling day.

__Information and Equipment.__ The following information/measurements must be reviewed/collected prior to initiating purging/sampling activities:

- Well construction data.
- Total well depth;
- Approximate yield (flow rate);
- Approximate depth to water; and
- Well diameter

The following equipment will be used to perform sampling:

- Water level measuring device (oil/water interface probe, if appropriate) with minimum 0.01 foot accuracy;
- Flame Ionization Detector (FID) or Photo Ionization Detector (PID);
- Adjustable rate, positive displacement groundwater sampling pump, capable of pumping at rates as low as 250 ml/minute;
- Teflon or Teflon-lined polyethylene tubing to collect samples for organic analysis. Teflon or Teflon-lined polyethylene, PVC, tygon or polyethylene tubing to collect samples for inorganic analysis;
- Flow measurement supplies;
- Power source;
- YSI (or equivalent) water quality meter contained within an in-line flow through cell;

- Monitoring instruments for indicator parameters. Indicator parameters will be monitored in line using an instrument with a continuous readout display;
- Decontamination supplies;
- Logbook;
- Sample bottles;
- Sample preservation supplies;
- Sample labels and chain of custody; and
- Coolers.

Procedures. The monitoring wells will be sampled systematically from the known, or believed to be the least contaminated to the most contaminated monitoring well. The wells will be sampled as follows:

1. Check well lock for damage, or evidence of tampering.

2. Check monitoring well for non-aqueous phase liquids. Do not use this procedure if non-aqueous phase liquids are present.

3. Measure static water level with an electric well probe (or by other reliable means e.g., wetted tape) to an accuracy of 0.01 foot from the surveyed reference point marked on the well casing.

4. Calculate the height of the water column by subtracting the depth to water from the total well depth.

5. Calculate the volume of standing water contained in the well by multiplying the height of the column of water by the volume of water per foot.

6. Evacuate the well as follows:

   a) Install pump, and slowly lower the pump, safety cable, tubing, and electrical lines into the well to the depth specified for that well. For the overburden monitoring wells, the pump intake will be set at the mid-point of the 10-foot screened interval. For the bedrock monitoring wells, the pump intake will be set at the mid-point of the water-bearing interval (e.g. fracture zone) identified during well drilling activities. The pump intake must be kept at least two feet above the bottom of the well to prevent disturbance and re-suspension of any sediment in the bottom of the well. Record the depth to which the pump is lowered.

b) Measure water level before starting the pump, leave the water level measuring device in the well during purging.

c) Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stable water level (drawdown 0.3 feet or less). Pumping rates should be reduced, if needed, to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measure immediately after each adjustment.

7. During well purging, monitor and record the field indicator parameters (temperature, specific conductance, pH, oxidation/reduction potential [ORP], and dissolved oxygen) approximately every five minutes. Purging will be judged to be complete when three consecutive readings are obtained within the following ranges recommended by the EPA:

   +/-0.1 s.u. for pH;
   +/-3% for specific conductance;
   +/-10 mv for ORP;
   +/-10% for DO; and
   +/-10% turbidity values > 1 NTU

   Dissolved oxygen usually requires the longest time to achieve stabilization, so it will be the primary indicator of stabilization. A minimum volume of groundwater, equal to twice the volume of the sampling equipment in the well, will be purged from each monitoring well.

8. Samples should be collected at a flow rate of approximately 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 feet. Do not remove the pump from the well between purging and sampling. VOC samples will be collected first, and will be collected directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.

Appendix E

Groundwater Sample Analytical Data Sheets

RAYTHEON ENGINEERS & CONSTRUCTORS
RAYTHEON ENVIRONMENTAL SERVICES LABORATORY

301 Chelsea Parkway
Boothwyn, Pa. 19061
(610) 497-8000

Report For:

McLaren/Hart (Ganes Chemicals)
Mr. Paul Michaels
470 Norristown Rd. Suite 300
Blue Bell PA 19422

Job Number

75701740

Summary Number

49004

November 17, 1999

Reviewed by Mary E Pierce
Project Manager Mary Pierce

NJ ID# 77343	EPA ID# PA00078	PA ID# 23-272
CA ID# 1924	CO ID# PA00078	CT ID# PH0687
RI ID# A70	DE ID# PA00078	WV ID# 9915(C)
TN ID# 2927	NY ID# 11345	MA ID# M-PA078

Raythe Engineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49004

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analy
203911A	Ganes MW-6	G1825	1,1,1-Trichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	1,1,2-Trichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	1,1-Dichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	1,1-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	1,2-Dichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	1,2-Dichloropropane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	2-Butanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	2-Hexanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	4-Methyl-2-Pentanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Acetone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Benzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Bromodichloromethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Bromoform	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Bromomethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Carbon Disulfide	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Carbon Tetrachloride	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Chlorobenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Chloroethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Chloroform	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Chloromethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Dibromochloromethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Ethylbenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Methyl-t-butyl Ether	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Methylene Chloride	ND B	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Styrene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Tetrachloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Toluene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Trichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Vinyl Chloride	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Xylenes-Meta&Para	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	Xylenes-Ortho	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203911A	Ganes MW-6	G1825	cis-1,2-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM

Raythec ngi eers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49004

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analys
203912A	Ganes MW-2	G1825	Chlorobenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Chloroethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Chloroform	0.6	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Chloromethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Dibromochloromethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Ethylbenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Methyl-t-butyl Ether	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Methylene Chloride	ND B	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Styrene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Tetrachloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Toluene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Trichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Vinyl Chloride	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Xylenes-Meta&Para	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	Xylenes-Ortho	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	cis-1,2-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	cis-1,3-Dichloropropene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	trans-1,2-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912A	Ganes MW-2	G1825	trans-1,3-Dichloropropene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203912B	Ganes MW-2	2331C	Fe Iron-D	11		mg/l	11/02/1999	11/16/1999	11/16/1999	LAW
203912B	Ganes MW-2	2421C	Mn Manganese-D	11		mg/l	11/02/1999	11/16/1999	11/16/1999	LAW
203912C	Ganes MW-2	G16	Methane	ND	20	ug/L	11/02/1999	11/10/1999	11/10/1999	JNK
203912D	Ganes MW-2	332CD	Nitrogen NO3-N	ND (0.1)		mg/l	11/02/1999	11/03/1999	11/03/1999	GCW
203912D	Ganes MW-2	397	BOD 5-day	12		mg/l	11/02/1999	11/03/1999	11/08/1999	GCW
203912D	Ganes MW-2	411	Alkalinity	250		mg/l as CaCO3	11/02/1999	11/04/1999	11/04/1999	MXO
203912D	Ganes MW-2	450	Sulfate	80		mg/l	11/02/1999	11/08/1999	11/08/1999	JSK
203912D	Ganes MW-2	S07	Residue TDS	560		mg/l	11/02/1999	11/05/1999	11/06/1999	MCH
203912E	Ganes MW-2	111	Carbon TOC	2.1		mg/l	11/02/1999	11/08/1999	11/08/1999	GCW
203912E	Ganes MW-2	403	COD	24		mg/l	11/02/1999	11/05/1999	11/05/1999	JMR
203913A	Ganes MW-1	G1825	1,1,1-Trichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM

Raythe ng eers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49004

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analy
203913B	Ganes MW-1	2331C	Fe Iron-D	28		mg/l	11/02/1999	11/16/1999	11/16/1999	LAW
203913B	Ganes MW-1	2421C	Mn Manganese-D	3.4		mg/l	11/02/1999	11/16/1999	11/16/1999	LAW
203913C	Ganes MW-1	G16	Methane	ND	20	ug/L	11/02/1999	11/10/1999	11/10/1999	JNK
203913D	Ganes MW-1	332CD	Nitrogen NO3-N	0.2		mg/l	11/02/1999	11/03/1999	11/03/1999	GCW
203913D	Ganes MW-1	397	BOD 5-day	10		mg/l	11/02/1999	11/03/1999	11/08/1999	GCW
203913D	Ganes MW-1	411	Alkalinity	70		mg/l as CaCO3	11/02/1999	11/04/1999	11/04/1999	MXO
203913D	Ganes MW-1	450	Sulfate	30		mg/l	11/02/1999	11/08/1999	11/08/1999	JSK
203913D	Ganes MW-1	S07	Residue TDS	160		mg/l	11/02/1999	11/05/1999	11/06/1999	MCH
203913E	Ganes MW-1	111	Carbon TOC	2.0		mg/l	11/02/1999	11/08/1999	11/08/1999	GCW
203913E	Ganes MW-1	403	COD	ND (20)		mg/l	11/02/1999	11/05/1999	11/05/1999	JMR
203914A	Ganes MW-3	G1825	1,1,1-Trichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	1,1,2-Trichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	1,1-Dichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	1,1-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	1,2-Dichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	1,2-Dichloropropane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	2-Butanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	2-Hexanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	4-Methyl-2-Pentanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Acetone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Benzene	0.9	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Bromodichloromethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Bromoform	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Bromomethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Carbon Disulfide	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Carbon Tetrachloride	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Chlorobenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Chloroethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Chloroform	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203914A	Ganes MW-3	G1825	Chloromethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM

Raythe Engineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49004

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Anal
203915	Ganes MW-X	G1825	1,2-Dichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	1,2-Dichloropropane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	2-Butanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	2-Hexanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	4-Methyl-2-Pentanone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Acetone	ND	5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Benzene	4	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Bromodichloromethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Bromoform	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Bromomethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Carbon Disulfide	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Carbon Tetrachloride	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Chlorobenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Chloroethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203915	Ganes MW-X	G1825	Chloroform	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAI
203915	Ganes MW-X	G1825	Chloromethane	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAI
203915	Ganes MW-X	G1825	Dibromochloromethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Ethylbenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Methyl-t-butyl Ether	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Methylene Chloride	ND B	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Styrene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Tetrachloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Toluene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Trichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Vinyl Chloride	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Xylenes-Meta&Para	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	Xylenes-Ortho	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	cis-1,2-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	cis-1,3-Dichloropropene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	trans-1,2-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203915	Ganes MW-X	G1825	trans-1,3-Dichloropropene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203916	Ganes TB	G1825	1,1,1-Trichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203916	Ganes TB	G1825	1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA
203916	Ganes TB	G1825	1,1,2-Trichloroethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JA

Raythe ngi ers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49004

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analy
203917A	Ganes MW-4	G1825	1,1,2,2-Tetrachloroethane	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	1,1,2-Trichloroethane	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	1,1-Dichloroethane	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	1,1-Dichloroethene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	1,2-Dichloroethane	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	1,2-Dichloropropane	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	2-Butanone	ND	50000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	2-Hexanone	ND	50000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	4-Methyl-2-Pentanone	ND	50000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Acetone	ND	50000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Benzene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Bromodichloromethane	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Bromoform	ND	10000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Bromomethane	ND	10000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Carbon Disulfide	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Carbon Tetrachloride	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Chlorobenzene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Chloroethane	ND	10000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Chloroform	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Chloromethane	ND	10000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Dibromochloromethane	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Ethylbenzene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Methyl-t-butyl Ether	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Methylene Chloride	10000 JB	10000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Styrene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Tetrachloroethene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Toluene	250000	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Trichloroethene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Vinyl Chloride	ND	10000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Xylenes-Meta&Para	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	Xylenes-Ortho	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	cis-1,2-Dichloroethene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	cis-1,3-Dichloropropene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	trans-1,2-Dichloroethene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203917A	Ganes MW-4	G1825	trans-1,3-Dichloropropene	ND	5000	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM

Raythec ng eers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49004

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analys
203918	Ganes FB-11/2/99	G1825	Dibromochloromethane	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Ethylbenzene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Methyl-t-butyl Ether	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Methylene Chloride	0.8 JB	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Styrene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Tetrachloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Toluene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Trichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Vinyl Chloride	ND	1	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Xylenes-Meta&Para	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	Xylenes-Ortho	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	cis-1,2-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	cis-1,3-Dichloropropene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	trans-1,2-Dichloroethene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM
203918	Ganes FB-11/2/99	G1825	trans-1,3-Dichloropropene	ND	0.5	ug/L	11/02/1999	11/04/1999	11/04/1999	JAM

Approved by:

Report Prep:

Constructors, Inc.
Laboratory
301 Chelsea Parkway
Boothwyn, PA 19061
Tel 610.497.8000
Fax 610.497.8005

Raytheon Engineers & Constructors

TECHNICAL BULLETIN

SUBJECT: LABORATORY CONTAMINATION & METHOD BLANK INTERPRETATION

Method blanks are required in environmental analyses in order to demonstrate that the analytical systems are contaminant free. Unfortunately, environmental laboratories are a part of the real world. As a result of this, chronic low level contamination may occur in method blanks as well as in samples.

The most common laboratory contaminant is methylene chloride. Methylene chloride in significant quantities is widely used in environmental laboratories as the extraction solvent of choice for semivolatiles, pesticides/PCBs and other environmental contaminants. Unfortunately, it can be rather tenacious upon introduction to the ambient air. It can be carried through areas of the laboratory via analysts' lab coats. It also has the ability to permeate plastics or even the method specified septa of a VOA vial. Raytheon Laboratories has invested significant time and capital expenditures to employ decontamination procedures such as air handling, high purity water systems and a separate volatiles laboratory in order to minimize contamination.

Published EPA methods (500 series, 600 series and SW-846 8000 methods) state that the contaminant levels in the method blank should be "reduced to an acceptable level before proceeding," "under control," or "less than the level of acceptable blank contamination specified in the approved quality assurance plan."

Regulatory agencies have acknowledged this problem. The USEPA and several state agencies have recognized a group of compounds as "common laboratory contaminants." This list includes acetone, methyl ethyl ketone, methylene chloride and the phthalate esters. According to their regulations, a method blank cannot contain these contaminants at a level five times above their practical quantitation limit (PQL). All other target analytes in the method blank must be below practical quantitation limits (PQL). Raytheon Laboratories employs these criteria in determining method blank acceptability.

In an effort to meet regulatory requirements as well as to provide as much information as possible to our clients, you may see a value for methylene chloride that contains a "J" or a "B" flag next to it. These flags were taken from USEPA CLP (Contract Laboratory Program) protocols. The "J" flag indicates the value found is an estimated value. This "J" value is above the method detection limit (MDL) but below the normal reporting limit or practical quantitation limit (PQL). The "B" flag alerts regulators that target compound levels found in the sample may be elevated due to laboratory contamination.

The level of methylene chloride at Raytheon Laboratories found in our method blanks is as low or lower than the levels found in most other environmental laboratories.

Raytheon

Laboratory Chain Of Custody

Quote No.:

Client: McLaren/Hart   Location: Carlstadt, NJ

Project Description: Gaves chemical

Send report To: Paul Michaels   Phone: 610-567-1500

Address: 470 Norristown RD, suite 300 BlueBell, PA 19422

TAT (for data): Identify number of "working days" below);...or Date-->:

☐ Rush 1 2 3 4 5 days ☐ Firm(6-12)____ ☒ Std.(~12)____ ☐ Other____

Lab Staffer confirming Rush/Firm: ____ Hardcopy TAT Date?: ____

Report Type: ☐ Results only ☐ Data+QC ☐ Reduced Deliv. ☐ Other: ____ ☐ Regulatory Format (CLP "like") ☐ Electronic/disk->(Format?) ____

Regulatory Samples? ☐ YES ☐ NO   If YES ?: ☐ Act II ☐ UST ☐ RCRA ☐ NPDES ☐ Phase I/II ☒ ISRA ☐ Other: ____

Analytical Protocol: ☐ Drinking H2O ☐ SW846 ☐ ASTM ☐ EPA600 ☐ Other:

Ship To: Lab Job No: 7570/740

Send invoice to: Ziggy Karpa

Address: See previous

P.O. No.:

Raytheon Laboratory
301 Chelsea Parkway
Boothwyn PA, 19061
Phone: 610-497-8023
Fax: 610-485-5274

Lab Use Only
3/3/99
Due Date:
Cooler Tmp deg C
custody seal yes__ no__
No.:
Summary No. 49004

Analysis Required: VOC's - method 8260 | dissolved Fe+Mn | methane | Nitrate, sulfate, Alkalinity, TDS, BOD | TOC, COD

*(1) Bottle METHANE Recvd. BROKEN

ID (NJ limit=7 characters)	date	time	matrix	grab	comp	type	no.	preservative	pH	VOC's - method 8260	dissolved Fe+Mn	methane	Nitrate, sulfate, Alkalinity, TDS, BOD	TOC, COD	Lab Log No.
MW-6	11-2	0955	AQ	✓			7	See bottles		2	1	2	1	1	203911 A-E
* MW-2	↓	1105	↓	↓			7	↓		2	1	2	1	1	203912 A-E
MW-1		1210					7			2	1	2	1	1	203913 A-E
MW-3		1320					7			2	1	2	1	1	203914 A-E
MW-X		1310					2	HCl		2	~~1~~	~~2~~	~~1~~	~~1~~	203915
TB		—					2	—		2					203916
MW-4		1550					7	See bottles		2	1	2	1	1	203917 A-E
FB-11/2/99		1520					2	HCl		2					203918
~~MW-4d~~							~~7~~	~~See bottles~~		~~2~~	~~1~~	~~2~~	~~1~~	~~1~~	

Comments/Special Handling/Storage/Disposal--->: Nitrate is 48 HR holding time. Contact Paul Michaels of McLaren/Hart if method numbers are unknown.

Sampled by: SU
Phone no: 610-567-1500

Relinquished By:		Received By:		Method of Shipment
Name: [signature] Organization: M/H	Date: 11/2/99 Time:	Name: L. McKenna Ke[illegible] Organization:	Date: 11/3/99 Time: 0930	Airbill No.
Name: Organization:	Date: Time:	Name: Organization:	Date: Time:	
Name: Organization:	Date: Time:	Name: Organization:	Date: Time:	

Data File : C:\HPCHEM\1\DATA\110499G1\G110408.D
Acq On : 4 Nov 1999 12:06
Sample : 203911A MW-6
Misc : 25ML
MS Integration Params: rteint.p
Quant Time: Nov 4 12:53 1999

Vial: 23
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

Quant Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration
DataAcq Meth : G110199

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.39	168	316383	10.00	ug/L	0.00
23) 1,4-Difluorobenzene	8.54	114	439999	10.00	ug/L	0.00
36) Chlorobenzene-d5	13.36	117	243102	10.00	ug/L	0.00
54) 1,4-Dichlorobenzene-d4	17.49	152	93711	10.00	ug/L	0.00
System Monitoring Compounds						
20) Dibromofluoromethane	7.27	111	107478	9.38	ug/L	0.00
Spiked Amount 10.000			Recovery	=	93.80%	
37) Toluene-d8	10.93	98	377427	10.70	ug/L	0.00
Spiked Amount 10.000			Recovery	=	107.00%	
51) Bromofluorobenzene	15.43	95	97259	9.64	ug/L	0.00
Spiked Amount 10.000			Recovery	=	96.40%	

Target Compounds Qvalue

JAM
11-4-99

(#) = qualifier out of range (m) = manual integration

Raytheon Raytheon Engineers & Constructors

LABORATORY ORGANICS DATA SHEET

SAMPLE # : 203911C
MATRIX : WATER
CLIENT ID : Ganes MW-6
Sample wt/vol : 1ml

ANALYSIS DATE : 11/10/1999
RECVD DATE : 11/03/1999
ID FILE : g16.id
DATA FILE : L_SPC255

	Compound	Result ug/L	Detection Limit ug/L
1	Methane	ND	20

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.00 SUMMARY 49004

Raytheon Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 203912A
MATRIX : WATER
CLIENT ID : Ganes MW-2
Sample wt/vol : 25ML

ANALYSIS DATE : 11/04/1999
RECVD DATE : 11/03/1999
ID FILE : g1825.id
DATA FILE : G110409

	Compound	Result (ug/L)		Detection Limit (ug/L)
74-87-3	Chloromethane	ND		1
75-01-4	Vinyl Chloride	ND		1
74-83-9	Bromomethane	ND		1
75-00-3	Chloroethane	ND		1
75-35-4	1,1-Dichloroethene	ND		0.5
75-09-2	Methylene Chloride	ND	B	1
67-64-1	Acetone	ND		5
156-59-2	cis-1,2-Dichloroethene	ND		0.5
75-34-3	1,1-Dichloroethane	ND		0.5
156-60-5	trans-1,2-Dichloroethene	ND		0.5
67-66-3	Chloroform	0.6		0.5
78-93-3	2-Butanone	ND		5
[illegible]-55-6	1,1,1-Trichloroethane	ND		0.5
[illegible]-23-5	Carbon Tetrachloride	ND		0.5
[illegible]15-0	Carbon Disulfide	ND		0.5
[illegible]-78-6	2-Hexanone	ND		5
[illegible]-10-1	4-Methyl-2-Pentanone	ND		5
78-87-5	1,2-Dichloropropane	ND		0.5
10061-02-6	trans-1,3-Dichloropropene	ND		0.5
10061-01-5	cis-1,3-Dichloropropene	ND		0.5
1634-04-4	Methyl-t-butyl Ether	ND		0.5
71-43-2	Benzene	ND		0.5
107-06-2	1,2-Dichloroethane	ND		0.5
79-01-6	Trichloroethene	ND		0.5
75-27-4	Bromodichloromethane	ND		0.5
108-88-3	Toluene	ND		0.5
79-00-5	1,1,2-Trichloroethane	ND		0.5
079-34-5	1,1,2,2-Tetrachloroethane	ND		0.5
127-18-4	Tetrachloroethene	ND		0.5
124-48-1	Dibromochloromethane	ND		0.5
108-90-7	Chlorobenzene	ND		0.5
100-41-4	Ethylbenzene	ND		0.5
330-20-7	m&p-Xylenes	ND		0.5
95-47-6	o-Xylene	ND		0.5
100-42-5	Styrene	ND		0.5
75-25-2	Bromoform	ND		1

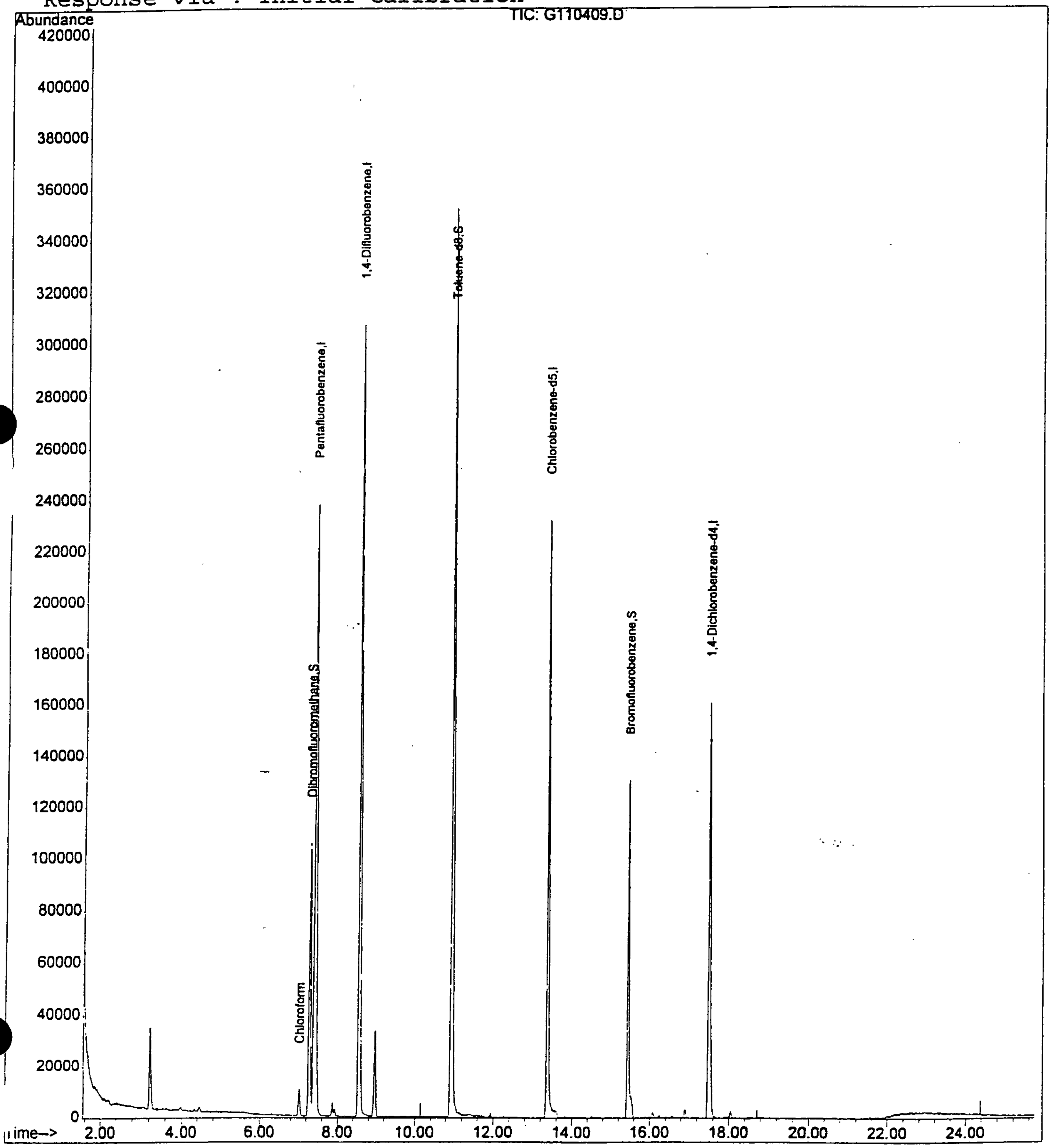
ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

Data File : C:\HPCHEM\1\DATA\110499G1\G110409.D
Acq On : 4 Nov 1999 12:39
Sample : 203912A MW-2
Misc : 25ML
MS Integration Params: rteint.p
Quant Time: Nov 4 13:50 1999

Vial: 24
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration



Raytheon Raytheon Engineers & Constructors

LABORATORY ORGANICS DATA SHEET

SAMPLE #	:	203912C	ANALYSIS DATE	:	11/10/1999
MATRIX	:	WATER	RECVD DATE	:	11/03/1999
CLIENT ID	:	Ganes MW-2	ID FILE	:	g16.id
Sample wt/vol	:	1ml	DATA FILE	:	L_SPC256

	Compound	Result ug/L	Detection Limit ug/L
1	Methane	ND	20

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.00 SUMMARY 49004

Raytheon

Raytheon Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

L[illegible] SAMPLE # : 203913A
MATRIX : WATER
CLIENT ID : Ganes MW-1
Sample wt/vol : 25ML

ANALYSIS DATE : 11/04/1999
RECVD DATE : 11/03/1999
ID FILE : g1825.id
DATA FILE : G110410

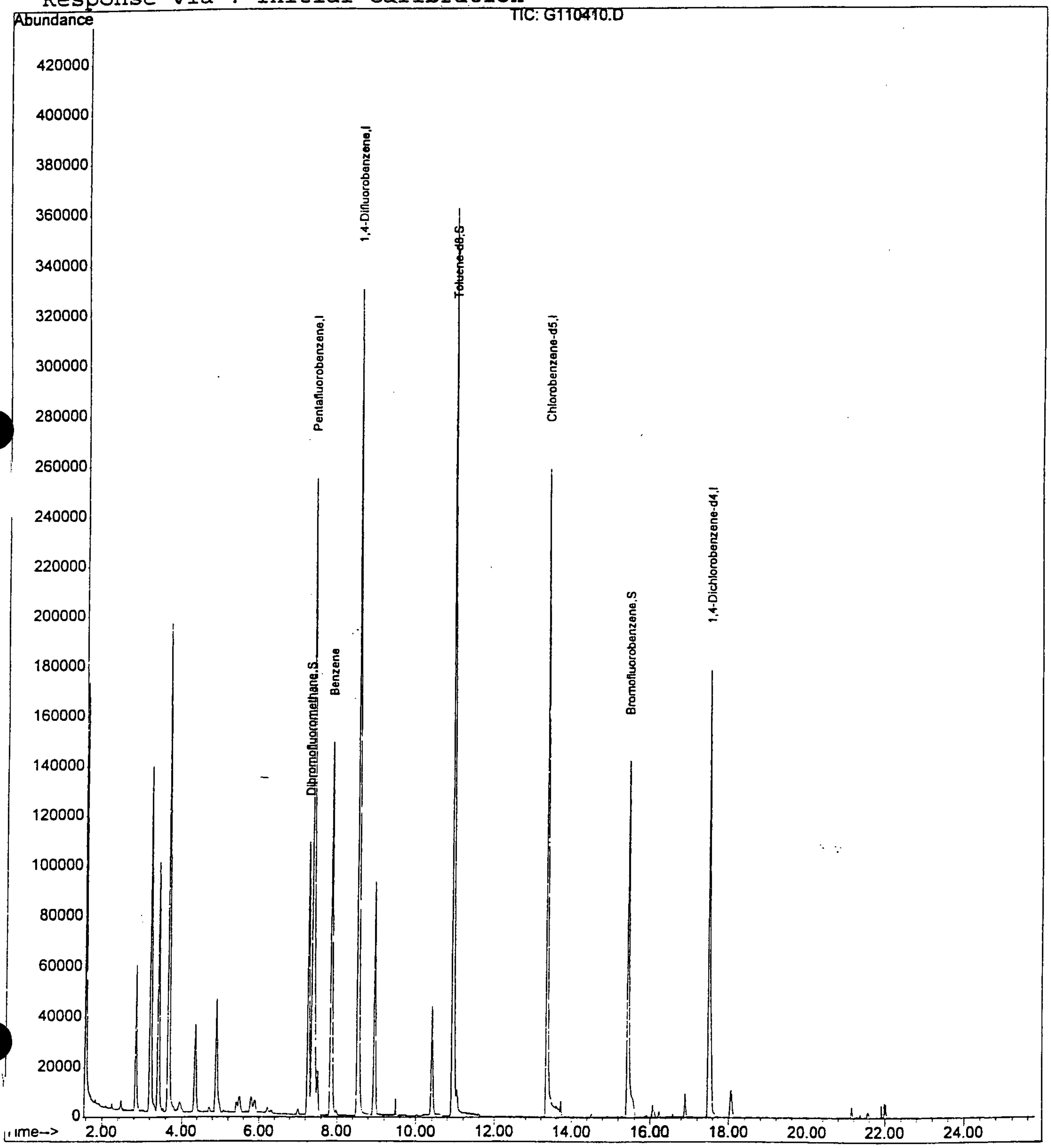
	Compound	Result (ug/L)		Detection Limit (ug/L)
74-87-3	Chloromethane	ND		1
75-01-4	Vinyl Chloride	ND		1
74-83-9	Bromomethane	ND		1
75-00-3	Chloroethane	ND		1
75-35-4	1,1-Dichloroethene	ND		0.5
75-09-2	Methylene Chloride	ND	B	1
67-64-1	Acetone	ND		5
156-59-2	cis-1,2-Dichloroethene	ND		0.5
75-34-3	1,1-Dichloroethane	ND		0.5
156-60-5	trans-1,2-Dichloroethene	ND		0.5
67-66-3	Chloroform	ND		0.5
78-93-3	2-Butanone	ND		5
[illegible]55-6	1,1,1-Trichloroethane	ND		0.5
[illegible]-23-5	Carbon Tetrachloride	ND		0.5
[illegible]15-0	Carbon Disulfide	ND		0.5
[illegible]78-6	2-Hexanone	ND		5
108-10-1	4-Methyl-2-Pentanone	ND		5
78-87-5	1,2-Dichloropropane	ND		0.5
10061-02-6	trans-1,3-Dichloropropene	ND		0.5
10061-01-5	cis-1,3-Dichloropropene	ND		0.5
1634-04-4	Methyl-t-butyl Ether	ND		0.5
71-43-2	Benzene	4		0.5
107-06-2	1,2-Dichloroethane	ND		0.5
79-01-6	Trichloroethene	ND		0.5
75-27-4	Bromodichloromethane	ND		0.5
108-88-3	Toluene	ND		0.5
79-00-5	1,1,2-Trichloroethane	ND		0.5
079-34-5	1,1,2,2-Tetrachloroethane	ND		0.5
127-18-4	Tetrachloroethene	ND		0.5
124-48-1	Dibromochloromethane	ND		0.5
108-90-7	Chlorobenzene	ND		0.5
100-41-4	Ethylbenzene	ND		0.5
330-20-7	m&p-Xylenes	ND		0.5
95-47-6	o-Xylene	ND		0.5
100-42-5	Styrene	ND		0.5
75-25-2	Bromoform	ND		1

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

Quantitation Report

```
Data File : C:\HPCHEM\1\DATA\110499G1\G110410.D          Vial: 25
Acq On    :  4 Nov 1999  13:22                        Operator: JAM
Sample    : 203913A  MW-1                             Inst    : GC/MS Ins
Misc      : 25ML                                      Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Nov  4 13:52 1999               Quant Results File: G110199.RES

Method          : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title           : 8260 25ml purge
Last Update     : Mon Nov 01 14:24:24 1999
Response via    : Initial Calibration
```



Raytheon Raytheon Engineers & Constructors

LABORATORY ORGANICS DATA SHEET

SAMPLE # : 203913C
MATRIX : WATER
CLIENT ID : Ganes MW-1
Sample wt/vol : 1ml

ANALYSIS DATE : 11/10/1999
RECVD DATE : 11/03/1999
ID FILE : g16.id
DATA FILE : L_SPC257

	Compound	Result ug/L	Detection Limit ug/L
1	Methane	ND	20

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.00 SUMMARY 49004

Raytheon

Raytheon Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 203914A
MATRIX : WATER
CLIENT ID : Ganes MW-3
Sample wt/vol : 25ML

ANALYSIS DATE : 11/04/1999
RECVD DATE : 11/03/1999
ID FILE : g1825.id
DATA FILE : G110411

	Compound	Result (ug/L)	Detection Limit (ug/L)
74-87-3	Chloromethane	ND	1
75-01-4	Vinyl Chloride	ND	1
74-83-9	Bromomethane	ND	1
75-00-3	Chloroethane	ND	1
75-35-4	1,1-Dichloroethene	ND	0.5
75-09-2	Methylene Chloride	ND B	1
67-64-1	Acetone	ND	5
156-59-2	cis-1,2-Dichloroethene	ND	0.5
75-34-3	1,1-Dichloroethane	ND	0.5
156-60-5	trans-1,2-Dichloroethene	ND	0.5
67-66-3	Chloroform	ND	0.5
78-93-3	2-Butanone	ND	5
[illegible]55-6	1,1,1-Trichloroethane	ND	0.5
[illegible]23-5	Carbon Tetrachloride	ND	0.5
[illegible]15-0	Carbon Disulfide	ND	0.5
[illegible]-78-6	2-Hexanone	ND	5
1[illegible]-10-1	4-Methyl-2-Pentanone	ND	5
78-87-5	1,2-Dichloropropane	ND	0.5
10061-02-6	trans-1,3-Dichloropropene	ND	0.5
10061-01-5	cis-1,3-Dichloropropene	ND	0.5
1634-04-4	Methyl-t-butyl Ether	2	0.5
71-43-2	Benzene	0.9	0.5
107-06-2	1,2-Dichloroethane	ND	0.5
79-01-6	Trichloroethene	ND	0.5
75-27-4	Bromodichloromethane	ND	0.5
108-88-3	Toluene	0.5 J	0.5
79-00-5	1,1,2-Trichloroethane	ND	0.5
079-34-5	1,1,2,2-Tetrachloroethane	ND	0.5
127-18-4	Tetrachloroethene	ND	0.5
124-48-1	Dibromochloromethane	ND	0.5
108-90-7	Chlorobenzene	ND	0.5
100-41-4	Ethylbenzene	ND	0.5
330-20-7	m&p-Xylenes	ND	0.5
95-47-6	o-Xylene	ND	0.5
100-42-5	Styrene	ND	0.5
75-25-2	Bromoform	ND	1

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

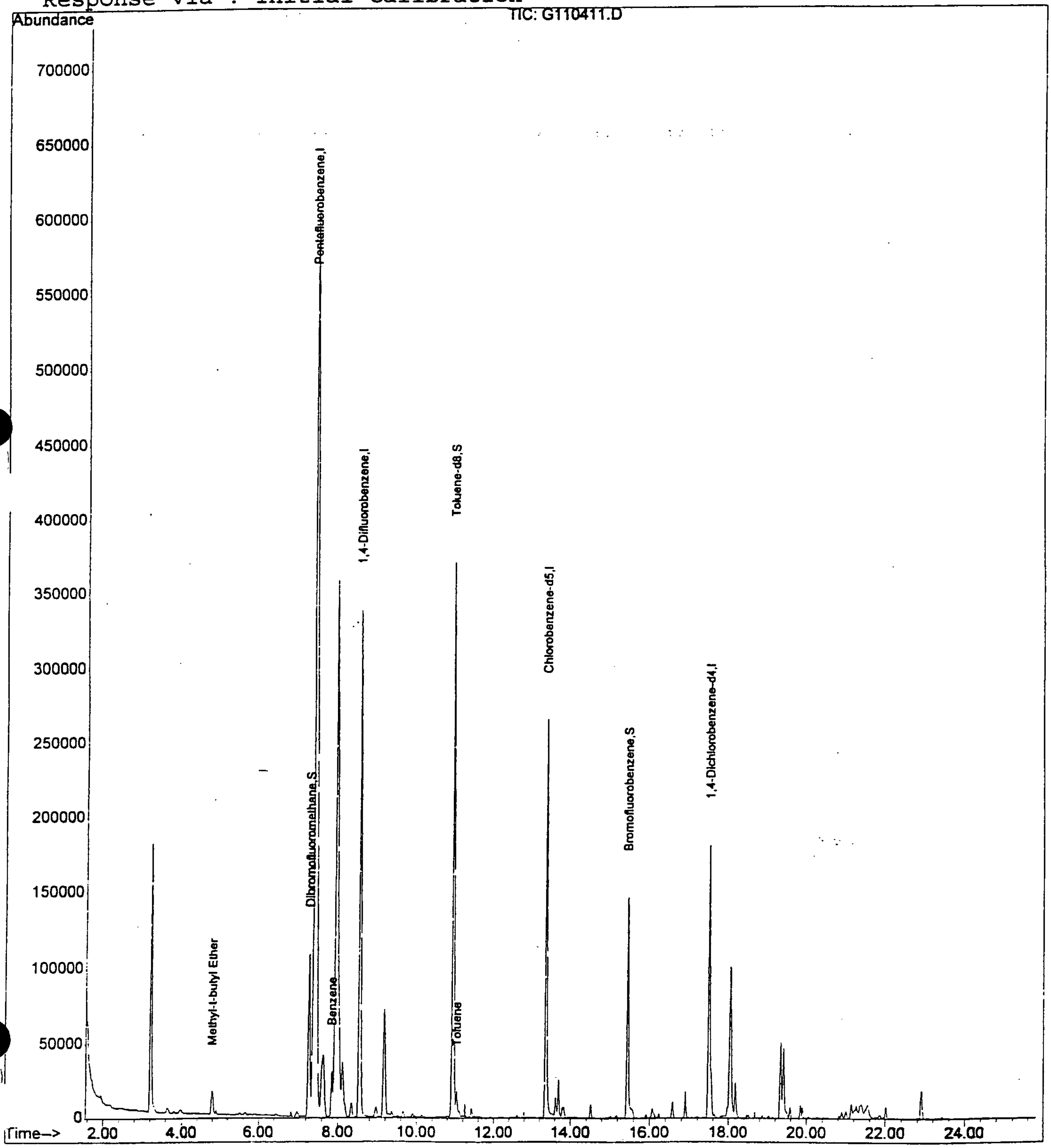
Quantitation Report

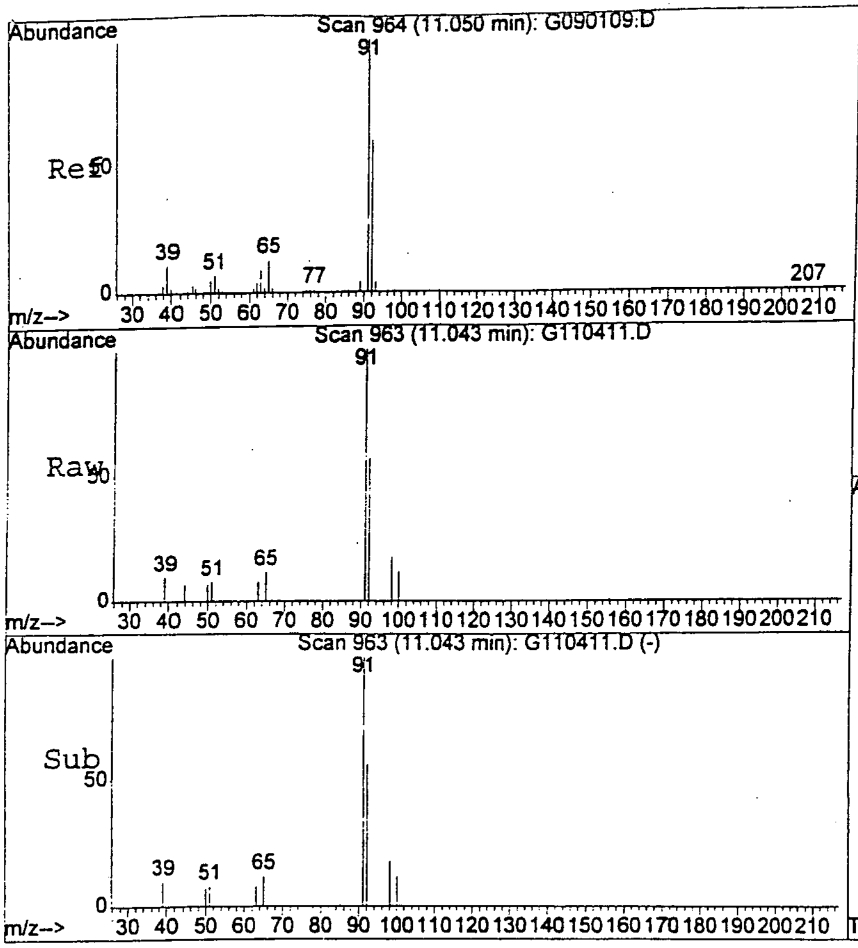
Data File : C:\HPCHEM\1\DATA\110499G1\G110411.D
Acq On : 4 Nov 1999 14:01
Sample : 203914A MW-3
Misc : 25ML
MS Integration Params: rteint.p
Quant Time: Nov 4 15:59 1999

Vial: 26
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration

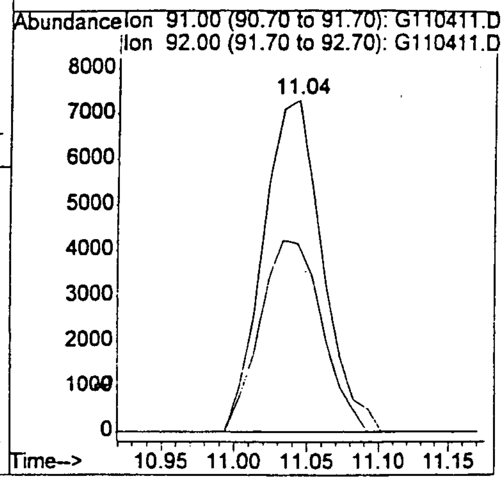




#40
Toluene
Concen: 0.46 ug/L
RT: 11.04 min Scan# 963
Delta R.T. 0.00 min
Lab File: G110411.D
Acq: 4 Nov 1999 14:01

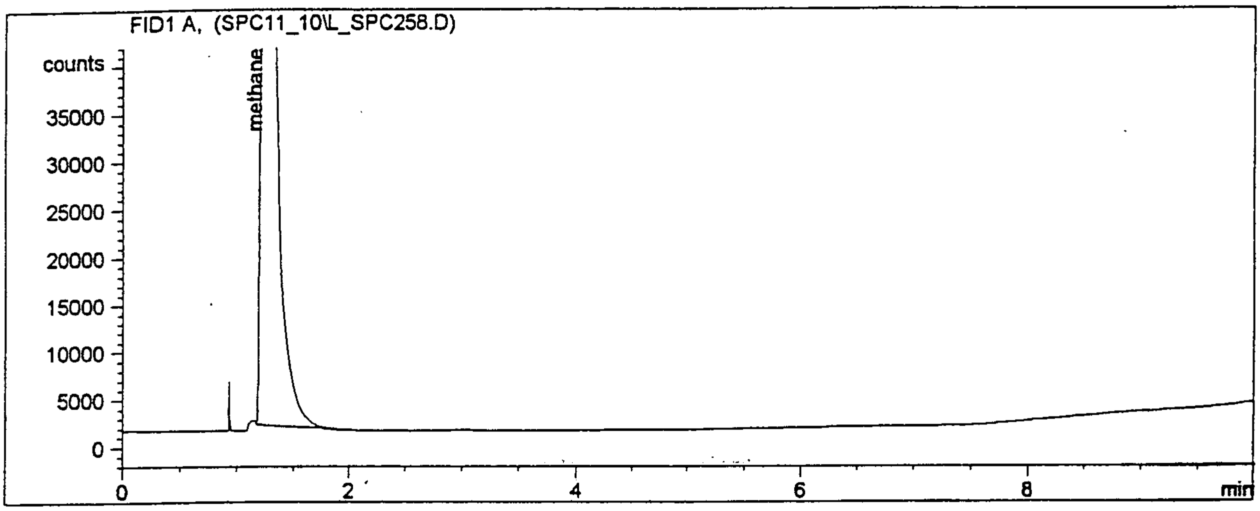
Tgt Ion: 91 Resp: 20680

Ion	Ratio	Lower	Upper
91	100		
92	60.6	47.8	71.6



Raytheon Engineers and Constructors
Environmental Laboratory
Boothwyn, PA

Sample Name : 203914C
Sample Information : 1ml/1ml ->
Data File Name : D:\HPCHEM\1\DATA\SPC11_10\L_SPC258.D
Analysis Method : D:\HPCHEM\1\METHODS\METH11A.M
Analysis Date : 11/10/1999
Injection Time : 2:30:21 PM
Aquisition Operator : JNK



#	Ret. T [min]	Compound Name	Area	Amount [ug/l]
1	1.263	methane	562904.3	425.4

JL 11/10/99

Data File : C:\HPCHEM\1\DATA\110499G1\G110412.D
Acq On : 4 Nov 1999 14:46
Sample : 203915 MW-X
Misc : 25ML
MS Integration Params: rteint.p
Quant Time: Nov 4 16:03 1999

Vial: 27
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

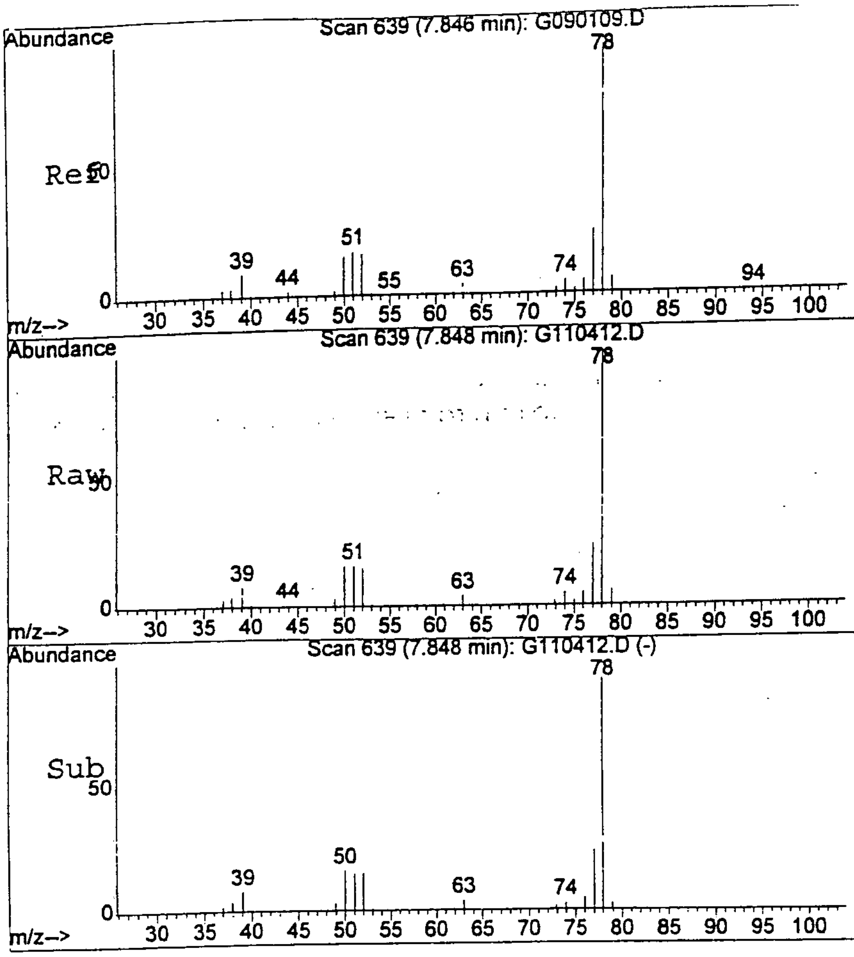
Quant Results File: G110199.RES

Quant Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration
DataAcq Meth : G110199

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.38	168	340543	10.00	ug/L	0.00
23) 1,4-Difluorobenzene	8.54	114	466120	10.00	ug/L	0.00
36) Chlorobenzene-d5	13.36	117	263830	10.00	ug/L	0.00
54) 1,4-Dichlorobenzene-d4	17.49	152	108680	10.00	ug/L	0.00
System Monitoring Compounds						
20) Dibromofluoromethane	7.27	111	111540	9.04	ug/L	0.00
Spiked Amount 10.000			Recovery	=	90.40%	
37) Toluene-d8	10.92	98	410580	10.72	ug/L	0.00
Spiked Amount 10.000			Recovery	=	107.20%	
51) Bromofluorobenzene	15.43	95	107731	9.84	ug/L	0.00
Spiked Amount 10.000			Recovery	=	98.40%	
Target Compounds						Qvalue
27) Benzene	7.85	78	238932	4.44	ug/L	100

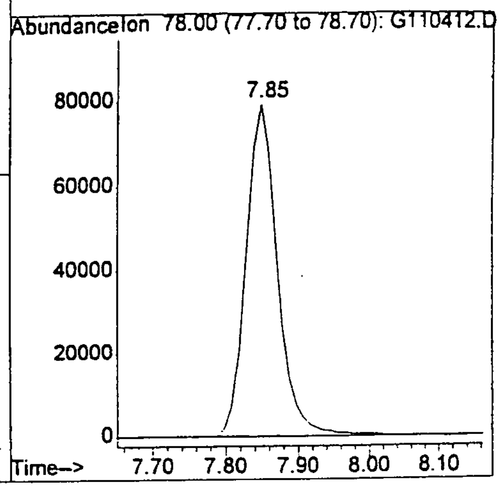
JAM
11-4-99

(#) = qualifier out of range (m) = manual integration



#27
Benzene
Concen: 4.44 ug/L
RT: 7.85 min Scan# 639
Delta R.T. -0.01 min
Lab File: G110412.D
Acq: 4 Nov 1999 14:46

Tgt Ion: 78 Resp: 238932



Data File : C:\HPCHEM\1\DATA\110499G1\G110406.D
Acq On : 4 Nov 1999 10:53
mple : 203916 TB
sc : 25ML
3 Integration Params: rteint.p
)uant Time: Nov 4 12:17 1999

Vial: 21
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

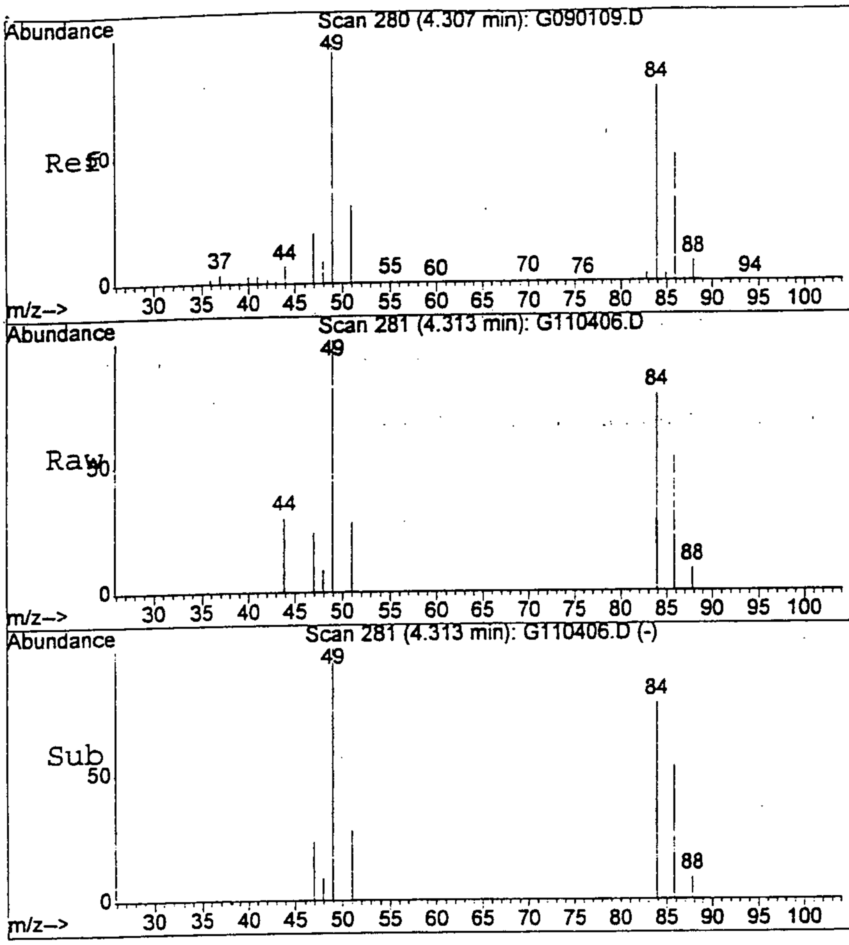
Quant Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration
DataAcq Meth : G110199

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Pentafluorobenzene	7.38	168	332450	10.00 ug/L	-0.01
23) 1,4-Difluorobenzene	8.53	114	467273	10.00 ug/L	-0.01
36) Chlorobenzene-d5	13.36	117	277074	10.00 ug/L	0.00
54) 1,4-Dichlorobenzene-d4	17.49	152	95167	10.00 ug/L	0.00
System Monitoring Compounds					
20) Dibromofluoromethane	7.26	111	120145	9.98 ug/L	-0.01
Spiked Amount 10.000			Recovery =	99.80%	
37) Toluene-d8	10.93	98	413899	10.29 ug/L	0.00
Spiked Amount 10.000			Recovery =	102.90%	
51) Bromofluorobenzene	15.43	95	106690	9.28 ug/L	0.00
Spiked Amount 10.000			Recovery =	92.80%	

arget Compounds	R.T.	QIon	Response	Conc Units	Qvalue
13) Methylene Chloride	4.31	49	13868	1.12 ug/L #	81

JAM
11-4-99

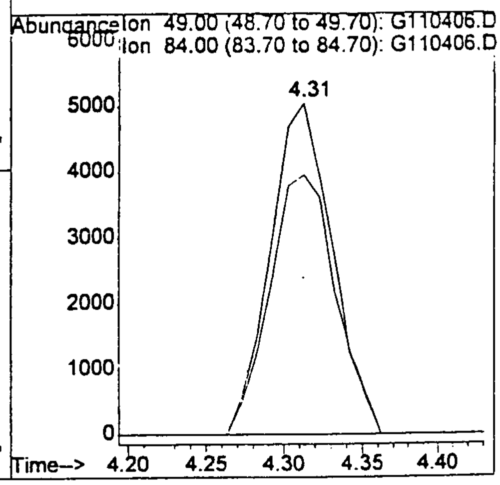
(#) = qualifier out of range (m) = manual integration



#13
Methylene Chloride
Concen: 1.12 ug/L
RT: 4.31 min Scan# 281
Delta R.T. -0.01 min
Lab File: G110406.D
Acq: 4 Nov 1999 10:53

Tgt Ion: 49 Resp: 13868

Ion	Ratio	Lower	Upper
49	100		
84	84.0	54.7	82.1#



Data File : C:\HPCHEM\1\DATA\110499G1\G110413.D
Acq On : 4 Nov 1999 15:22
Sample : 203917A MW-4
Misc : .0025ML
MS Integration Params: rteint.p
Quant Time: Nov 4 16:06 1999

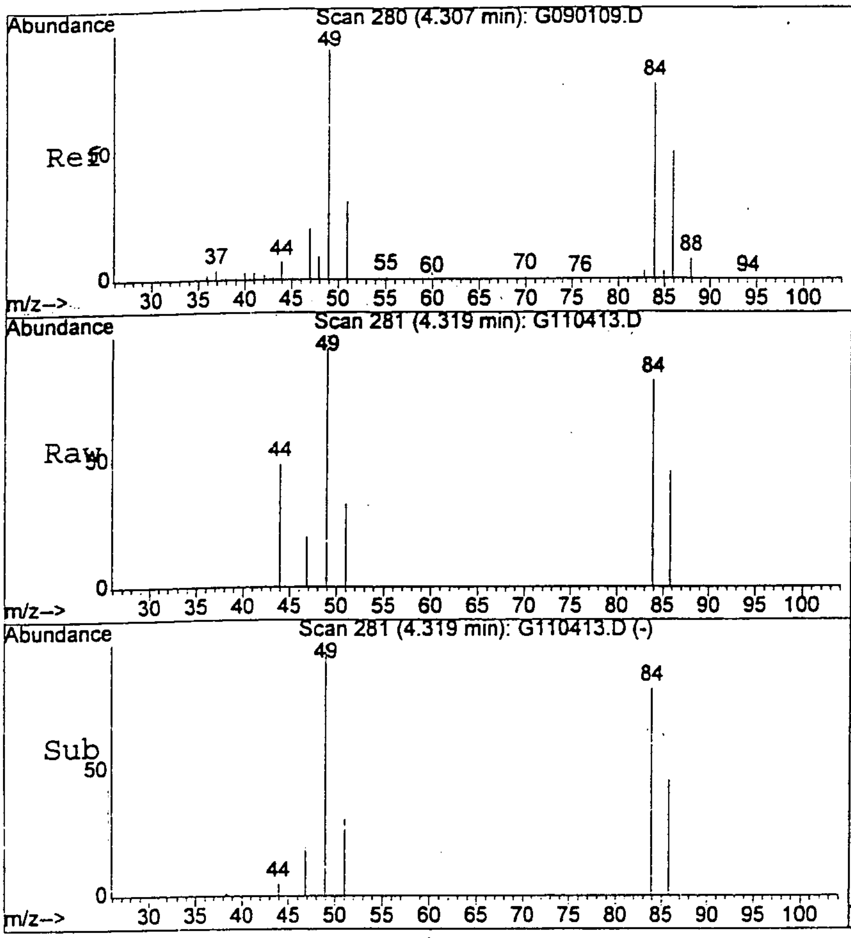
Vial: 28
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

Quant Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration
DataAcq Meth : G110199

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.39	168	296099	10.00	ug/L	0.00
23) 1,4-Difluorobenzene	8.54	114	421407	10.00	ug/L	0.00
36) Chlorobenzene-d5	13.36	117	245325	10.00	ug/L	0.00
54) 1,4-Dichlorobenzene-d4	17.49	152	94325	10.00	ug/L	0.00
System Monitoring Compounds						
20) Dibromofluoromethane	7.27	111	104993	9.79	ug/L	0.00
Spiked Amount 10.000			Recovery	=	97.90%	
37) Toluene-d8	10.94	98	364872	10.25	ug/L	0.00
Spiked Amount 10.000			Recovery	=	102.50%	
51) Bromofluorobenzene	15.43	95	91243	8.96	ug/L	0.00
Spiked Amount 10.000			Recovery	=	89.60%	
Target Compounds						Qvalue
13) Methylene Chloride	4.32	49	10782	0.98	ug/L	86
40) Toluene	11.04	91	1143375	25.09	ug/L	99

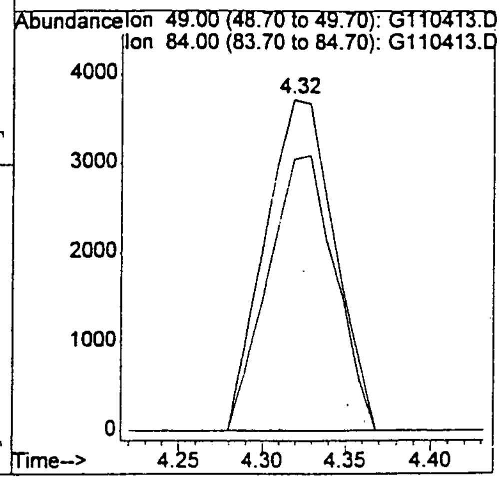
JAM
11-4-99

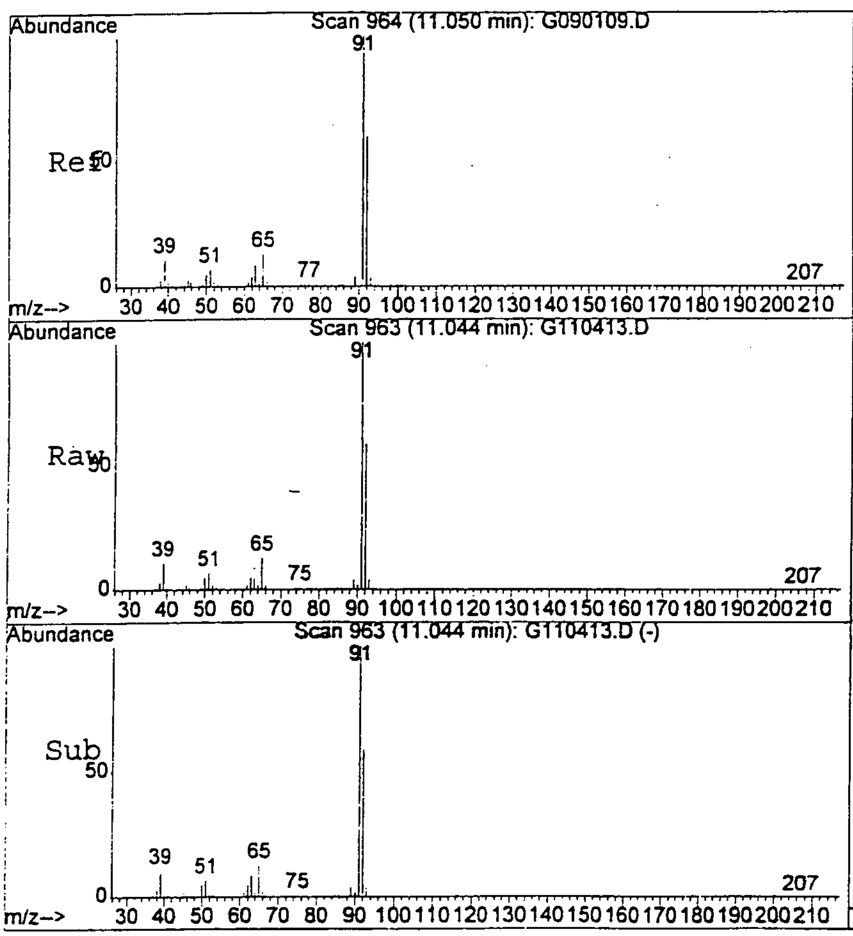


#13
Methylene Chloride
Concen: 0.98 ug/L
RT: 4.32 min   Scan# 281
Delta R.T.   -0.00 min
Lab File: G110413.D
Acq: 4 Nov 1999   15:22

Tgt Ion: 49 Resp: 10782

Ion	Ratio	Lower	Upper
49	100		
84	80.1	54.7	82.1

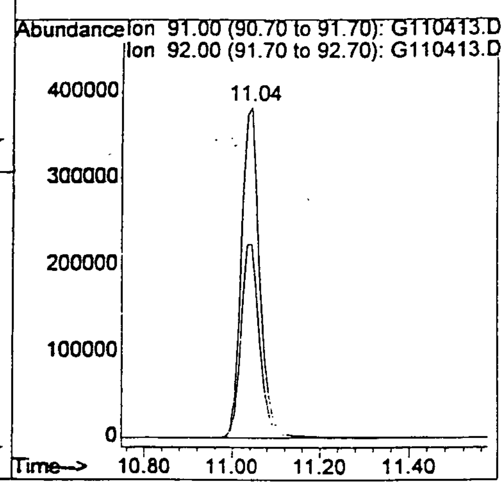




#40
Toluene
Concen: 25.09 ug/L
RT: 11.04 min   Scan# 963
Delta R.T.   0.01 min
Lab File: G110413.D
Acq: 4 Nov 1999   15:22

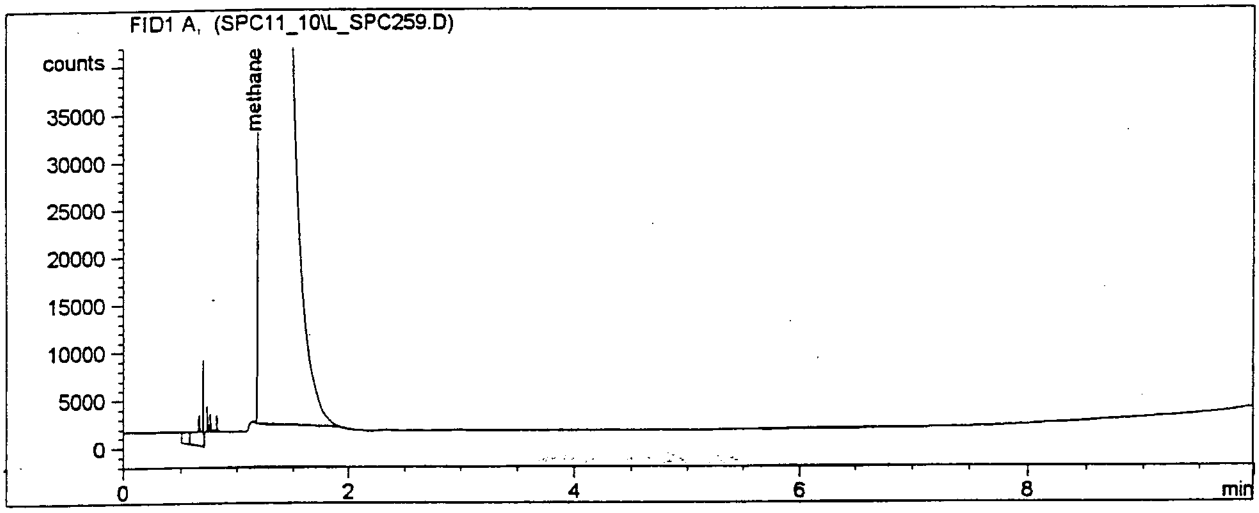
Tgt Ion: 91 Resp: 1143375

Ion	Ratio	Lower	Upper
91	100		
92	59.2	47.8	71.6



Raytheon Engineers and Constructors
Environmental Laboratory
Boothwyn, PA

Sample Name : 203917C
Sample Information : 1ml/1ml ->
Data File Name : D:\HPCHEM\1\DATA\SPC11_10\L_SPC259.D
Analysis Method : D:\HPCHEM\1\METHODS\METH11A.M
Analysis Date : 11/10/1999
Injection Time : 2:44:56 PM
Aquisition Operator : JNK



#	Ret. T [min]	Compound Name	Area	Amount [ug/l]
1	1.249	methane	4488919.0	3392.4

JN 11/10/99

Data File : C:\HPCHEM\1\DATA\110499G1\G110407.D
Acq On : 4 Nov 1999 11:30
Sample : 203918 FB
Misc : 25ML
MS Integration Params: rteint.p
Quant Time: Nov 4 12:19 1999

Vial: 22
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

Quant Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration
DataAcq Meth : G110199

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.38	168	321566	10.00	ug/L	0.00
23) 1,4-Difluorobenzene	8.53	114	457873	10.00	ug/L	0.00
36) Chlorobenzene-d5	13.36	117	267609	10.00	ug/L	0.00
54) 1,4-Dichlorobenzene-d4	17.49	152	100194	10.00	ug/L	0.00
System Monitoring Compounds						
20) Dibromofluoromethane	7.26	111	116900	10.04	ug/L	0.00
Spiked Amount 10.000			Recovery	=	100.40%	
37) Toluene-d8	10.92	98	399230	10.28	ug/L	0.00
Spiked Amount 10.000			Recovery	=	102.80%	
51) Bromofluorobenzene	15.43	95	96763	8.71	ug/L	0.00
Spiked Amount 10.000			Recovery	=	87.10%	
Target Compounds						Qvalue
13) Methylene Chloride	4.30	49	9490	0.79	ug/L	87

JAM
11-4-99

(#) = qualifier out of range (m) = manual integration

RAYTHEON ENGINEERS & CONSTRUCTORS
RAYTHEON ENVIRONMENTAL SERVICES LABORATORY

301 Chelsea Parkway
Boothwyn, Pa. 19061
(610) 497-8000

Report For:

McLaren/Hart (Ganes Chemicals)
Mr. Paul Michaels
470 Norristown Rd. Suite 300
Blue Bell PA 19422

Job Number

75701740

Summary Number

49065

November 17, 1999

Reviewed by Mary E Pierce
Project Manager Mary Pierce

NJ ID# 77343	EPA ID# PA00078	PA ID# 23-272
CA ID# 1924	CO ID# PA00078	CT ID# PH0687
RI ID# A70	DE ID# PA00078	WV ID# 9915(C)
TN ID# 2927	NY ID# 11345	MA ID# M-PA078

Raythe [illegible]ers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49065

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analy
204134A	Ganes MW-7	G1825	1,1,1-Trichloroethane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	1,1,2,2-Tetrachloroethane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	1,1,2-Trichloroethane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	1,1-Dichloroethane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	1,1-Dichloroethene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	1,2-Dichloroethane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	1,2-Dichloropropane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	2-Butanone	ND	120	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	2-Hexanone	ND	120	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	4-Methyl-2-Pentanone	350	120	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Acetone	100 J	120	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Benzene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Bromodichloromethane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Bromoform	ND	25	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Bromomethane	ND	25	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Carbon Disulfide	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Carbon Tetrachloride	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Chlorobenzene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Chloroethane	ND	25	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Chloroform	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Chloromethane	ND	25	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Dibromochloromethane	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Ethylbenzene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Methyl-t-butyl Ether	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Methylene Chloride	45 B	25	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Styrene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Tetrachloroethene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Toluene	25	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Trichloroethene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Vinyl Chloride	ND	25	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Xylenes-Meta&Para	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	Xylenes-Ortho	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM
204134A	Ganes MW-7	G1825	cis-1,2-Dichloroethene	ND	12	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM

Raythe[illegible] [illegible]ers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49065

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analy
204135A	Ganes MW-9	G1825	Chlorobenzene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Chloroethane	ND	2	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Chloroform	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Chloromethane	ND	2	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Dibromochloromethane	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Ethylbenzene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Methyl-t-butyl Ether	7	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Methylene Chloride	3 B	2	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Styrene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Tetrachloroethene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Toluene	14	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Trichloroethene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Vinyl Chloride	ND	2	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Xylenes-Meta&Para	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	Xylenes-Ortho	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	cis-1,2-Dichloroethene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	cis-1,3-Dichloropropene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	trans-1,2-Dichloroethene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135A	Ganes MW-9	G1825	trans-1,3-Dichloropropene	ND	1	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204135B	Ganes MW-9	G16	Methane	ND	20	ug/L	11/03/1999	11/10/1999	11/10/1999	JNK
204135C	Ganes MW-9	332CD	Nitrogen NO3-N	0.6		mg/l	11/03/1999	11/05/1999	11/05/1999	GCW
204135C	Ganes MW-9	397	BOD 5-day	12		mg/l	11/03/1999	11/04/1999	11/09/1999	GCW
204135C	Ganes MW-9	411	Alkalinity	140		mg/l as CaCO3	11/03/1999	11/09/1999	11/09/1999	MXO
204135C	Ganes MW-9	450	Sulfate	37		mg/l	11/03/1999	11/05/1999	11/05/1999	JSK
204135C	Ganes MW-9	S07	Residue TDS	460		mg/l	11/03/1999	11/09/1999	11/10/1999	MCH
204135D	Ganes MW-9	2331C	Fe Iron-D	ND<0.05		mg/l	11/03/1999	11/16/1999	11/16/1999	LAW
204135D	Ganes MW-9	2421C	Mn Manganese-D	1.4		mg/l	11/03/1999	11/16/1999	11/16/1999	LAW
204135E	Ganes MW-9	111	Carbon TOC	2.9		mg/l	11/03/1999	11/08/1999	11/08/1999	GCW
204135E	Ganes MW-9	403	COD	32		mg/l	11/03/1999	11/08/1999	11/08/1999	SMP
204136A	Ganes MW-8	G1825	1,1,1-Trichloroethane	ND	0.5	ug/L	11/03/1999	11/09/1999	11/09/1999	JAM

Raythe[illegible] [illegible]ers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 49065

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analy:
204136B	Ganes MW-8	G16	Methane	ND	20	ug/L	11/03/1999	11/10/1999	11/10/1999	JNK
204136C	Ganes MW-8	332CD	Nitrogen NO3-N	ND (0.1)		mg/l	11/03/1999	11/05/1999	11/05/1999	GCW
204136C	Ganes MW-8	397	BOD 5-day	29		mg/l	11/03/1999	11/04/1999	11/09/1999	GCW
204136C	Ganes MW-8	411	Alkalinity	150		mg/l as CaCO3	11/03/1999	11/09/1999	11/09/1999	MXO
204136C	Ganes MW-8	450	Sulfate	53		mg/l	11/03/1999	11/05/1999	11/05/1999	JSK
204136C	Ganes MW-8	S07	Residue TDS	430		mg/l	11/03/1999	11/09/1999	11/10/1999	MCH
204136D	Ganes MW-8	2331C	Fe Iron-D	0.26		mg/l	11/03/1999	11/16/1999	11/16/1999	LAW
204136D	Ganes MW-8	2421C	Mn Manganese-D	2.0		mg/l	11/03/1999	11/16/1999	11/16/1999	LAW
204136E	Ganes MW-8	111	Carbon TOC	20		mg/l	11/03/1999	11/08/1999	11/08/1999	GCW
204136E	Ganes MW-8	403	COD	100		mg/l	11/03/1999	11/08/1999	11/08/1999	SMP
204137A	Ganes MW-4D	G1825	1,1,1-Trichloroethane	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	1,1,2,2-Tetrachloroethane	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	1,1,2-Trichloroethane	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	1,1-Dichloroethane	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	1,1-Dichloroethene	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	1,2-Dichloroethane	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	1,2-Dichloropropane	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	2-Butanone	ND	500	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	2-Hexanone	ND	500	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	4-Methyl-2-Pentanone	ND	500	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Acetone	600	500	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Benzene	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Bromodichloromethane	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Bromoform	ND	100	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Bromomethane	ND	100	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Carbon Disulfide	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Carbon Tetrachloride	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Chlorobenzene	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Chloroethane	ND	100	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Chloroform	ND	50	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM
204137A	Ganes MW-4D	G1825	Chloromethane	ND	100	ug/L	11/03/1999	11/10/1999	11/10/1999	JAM

RAYTHEON ENGINEERS
ENVIRONMENTAL LABORATORY

Methods Used for Summary# 49065:

Code	Description
111	Carbon, Tot.Organic/UV,TC-IC /EPA 415.1/H2O reg
233IC	Iron by ICP/EPA 200.7/SW846 6010
242IC	Manganese by ICP/EPA 200.7/SW846 6010
332CD	Nitrate-Nitrogen/Cd reduction,automated/EPA 353.2
397	BOD/Standard Methods,18th ed, Mth 5210 includes nitrogenous
403	Chemical Oxygen Demand/spectrophotometric,manual/EPA 410.4
411	Alkalinity/titrimetric to pH 4.5/EPA 310.1
450	Sulfate/turbidimetric/EPA 375.4 (standard)
G16	Miscellaneous GC methods
G1825	GC/MS VOA 25ml purge/SW-846 Method 8260B
S07	Residue,Total Dissolved Solids/EPA-600 Method 160.1

Constructors, Inc.
Laboratory
301 Chelsea Parkway
Boothwyn, PA 19061
Tel 610.497.8000
Fax 610.497.8005

Raytheon Engineers & Constructors

SUMMARY OF METHOD BLANK ACCEPTANCE LEVELS

"Test Methods For Evaluating Solid Waste Physical/Chemical Methods" USEPA SW846 Method 8000B Section 8.2.6.5–

"Results of the method blank should be:

Less than the laboratory's MDL for the analyte or less than the level of acceptable blank contamination specified in the approved quality assurance plan.

Less than 5 % of the regulatory limit associated with an analyte

Or less than 5% of the sample result of the analyte, whichever is greater"

40 CFR Part 36, Appendix A Method 624 Section 8.1.3 –

"Analyze a reagent water blank to demonstrate that interferences are under control"

EPA-600/R-92/129 "Methods for the Determination of Organic Compounds in Drinking Water, Supplement II", Method 524.2 Section 9.2 –

"It must be demonstrated that a laboratory reagent blank (LRB) is reasonably free of contamination that would prevent the determination of any analyte of concern. Background contamination must be reduced to an acceptable level before proceeding. In general, background analytes should be below the method detection limit."

National Environmental Laboratory Accreditation Conference (NELAC) Standards, Section 5.0 "Quality Systems", Appendix D, Section D1.1.a –

"Sources of contamination must be investigated and measures taken to correct, minimize or eliminate the problem if:

The blank contamination exceeds a concentration greater than 1/10 of the measured concentration of any sample in the associated sample batch or

The blank contamination exceeds the concentration present in the samples and is greater than 1/10 of the specified regulatory limit

Any sample associated with the contaminated blank shall be reprocessed for analysis or the results reported with appropriate data qualifying codes."

Raytheon Raytheon
Engineers &
Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 204134A
MATRIX : WATER
CLIENT ID : Ganes MW-7
Sample wt/vol : 1ML

ANALYSIS DATE : 11/09/1999
RECVD DATE : 11/04/1999
ID FILE : g1825.id
DATA FILE : G110914

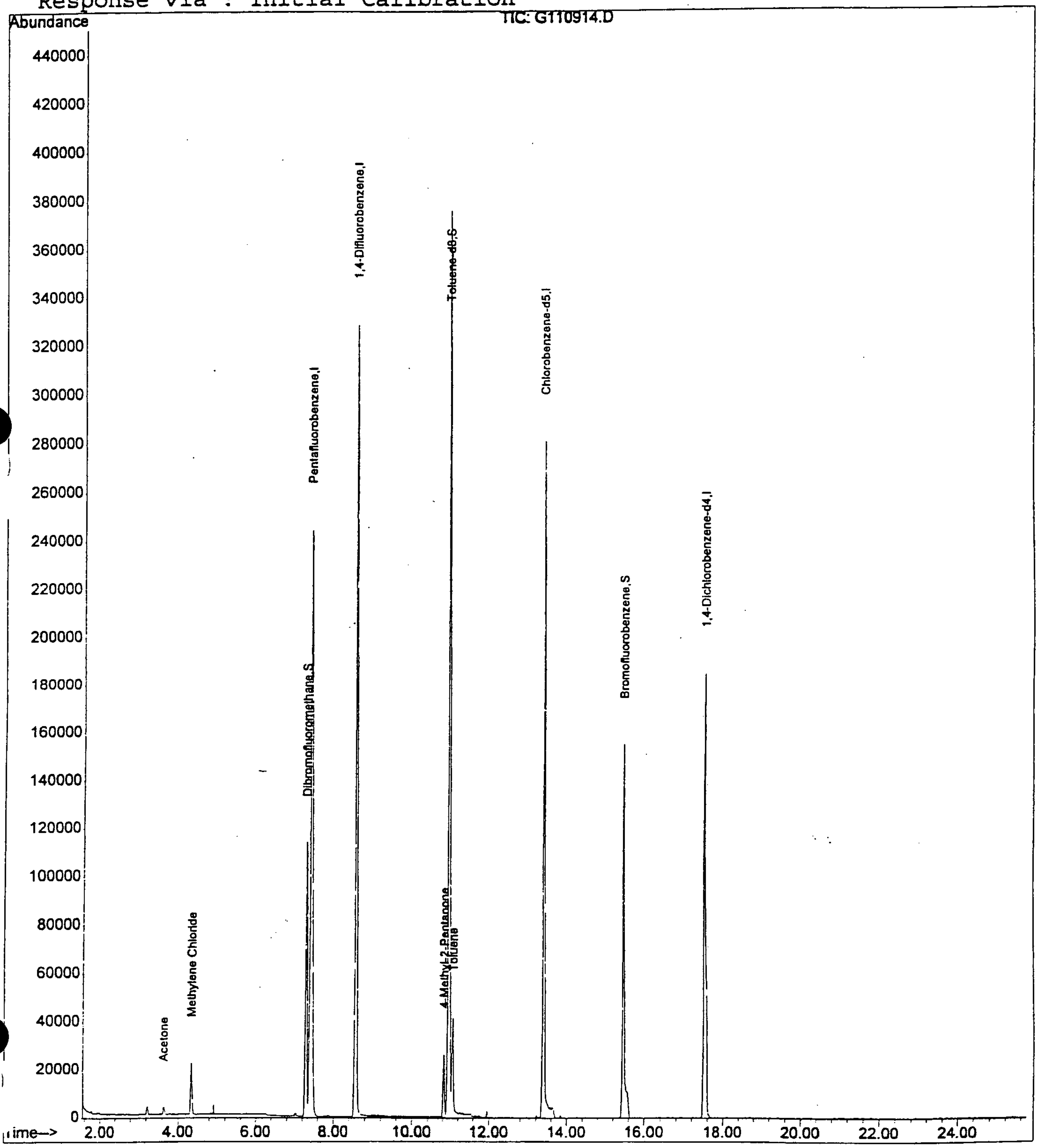
	Compound	Result (ug/L)	Detection Limit (ug/L)
74-87-3	Chloromethane	ND	25
75-01-4	Vinyl Chloride	ND	25
74-83-9	Bromomethane	ND	25
75-00-3	Chloroethane	ND	25
75-35-4	1,1-Dichloroethene	ND	12
75-09-2	Methylene Chloride	45 B	25
67-64-1	Acetone	100 J	120
156-59-2	cis-1,2-Dichloroethene	ND	12
75-34-3	1,1-Dichloroethane	ND	12
156-60-5	trans-1,2-Dichloroethene	ND	12
67-66-3	Chloroform	ND	12
78-93-3	2-Butanone	ND	120
[illegible]55-6	1,1,1-Trichloroethane	ND	12
[illegible]-23-5	Carbon Tetrachloride	ND	12
[illegible]15-0	Carbon Disulfide	ND	12
[illegible]-78-6	2-Hexanone	ND	120
1[illegible]-10-1	4-Methyl-2-Pentanone	350	120
78-87-5	1,2-Dichloropropane	ND	12
10061-02-6	trans-1,3-Dichloropropene	ND	12
10061-01-5	cis-1,3-Dichloropropene	ND	12
1634-04-4	Methyl-t-butyl Ether	ND	12
71-43-2	Benzene	ND	12
107-06-2	1,2-Dichloroethane	ND	12
79-01-6	Trichloroethene	ND	12
75-27-4	Bromodichloromethane	ND	12
108-88-3	Toluene	25	12
79-00-5	1,1,2-Trichloroethane	ND	12
079-34-5	1,1,2,2-Tetrachloroethane	ND	12
127-18-4	Tetrachloroethene	ND	12
124-48-1	Dibromochloromethane	ND	12
108-90-7	Chlorobenzene	ND	12
100-41-4	Ethylbenzene	ND	12
330-20-7	m&p-Xylenes	ND	12
95-47-6	o-Xylene	ND	12
100-42-5	Styrene	ND	12
75-25-2	Bromoform	ND	25

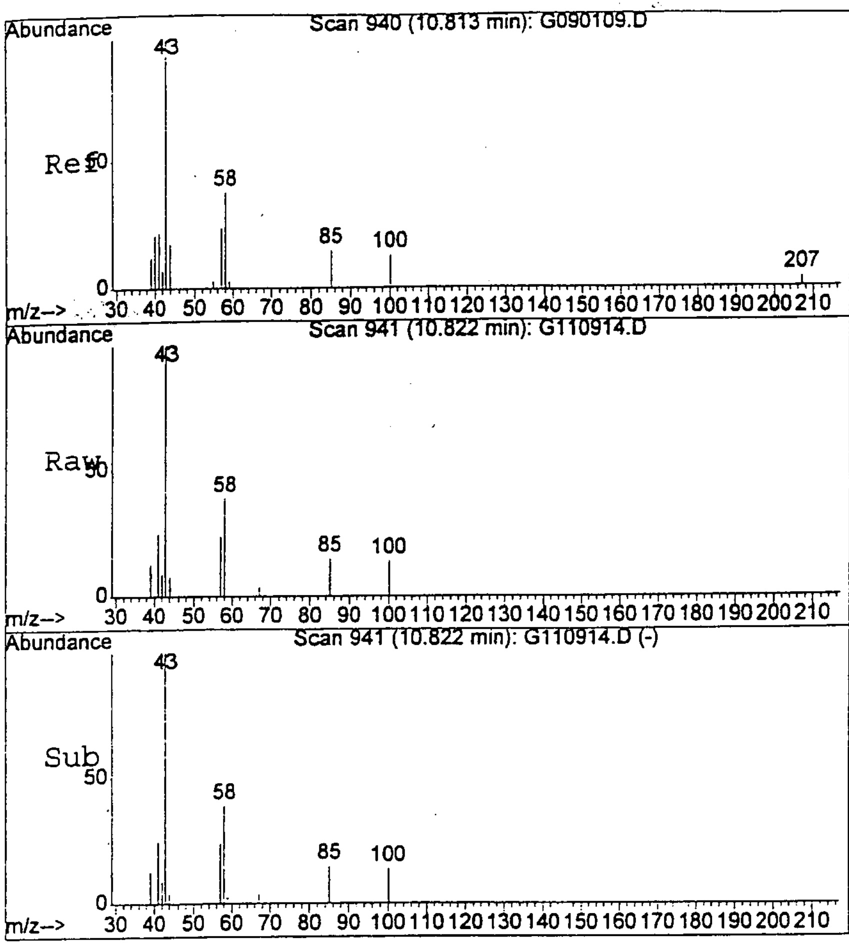
ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

25.0 SUMMARY 49065

Data File : C:\HPCHEM\1\DATA\110999G1\G110914.D Vial: 26
Acq On : 9 Nov 1999 15:16 Operator: JAM
Sample : 204134A MW-7 Inst : GC/MS Ins
Misc : 1ML Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Nov 10 8:11 1999 Quant Results File: G110199.RES

Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration

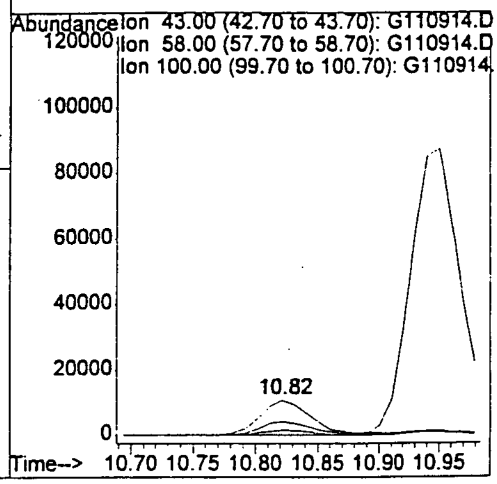


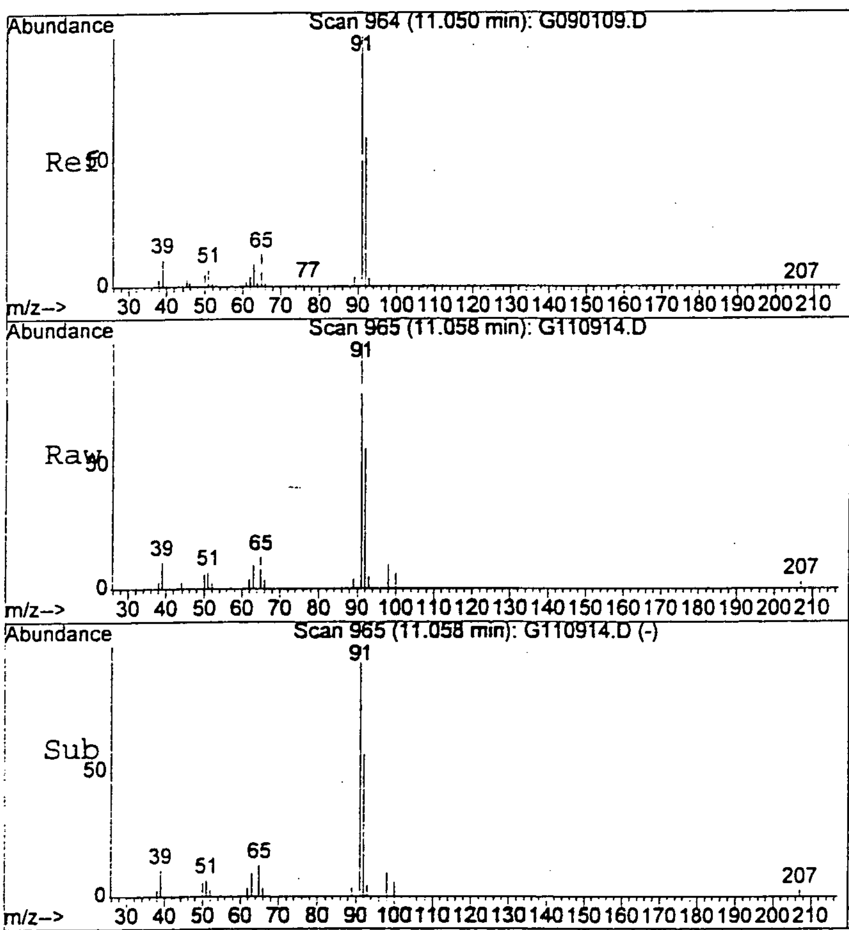


#39
4-Methyl-2-Pentanone
Concen: 14.11 ug/L
RT: 10.82 min Scan# 941
Delta R.T. 0.02 min
Lab File: G110914.D
Acq: 9 Nov 1999 15:16

Tgt Ion: 43 Resp: 30279

Ion	Ratio	Lower	Upper
43	100		
58	36.8	27.5	41.3
100	0.0	8.0	12.0#

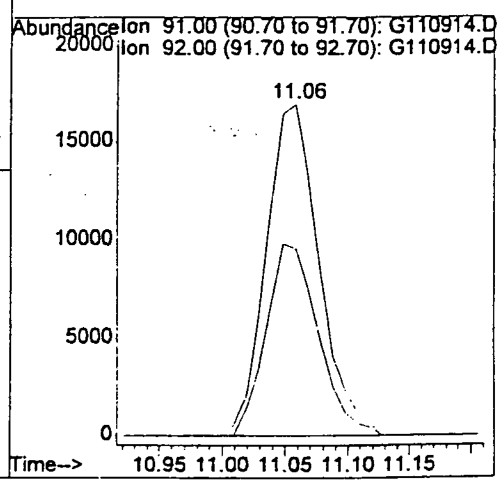




#40
Toluene
Concen: 1.01 ug/L
RT: 11.06 min Scan# 965
Delta R.T. 0.02 min
Lab File: G110914.D
Acq: 9 Nov 1999 15:16

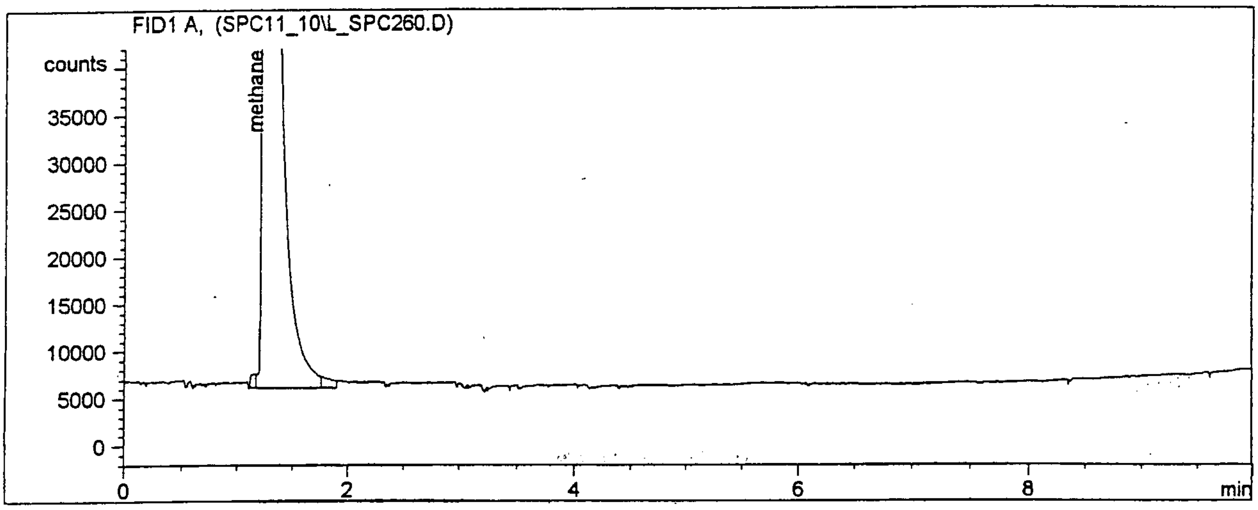
Tgt Ion: 91 Resp: 49591

Ion	Ratio	Lower	Upper
91	100		
92	57.5	47.8	71.6



Raytheon Engineers and Constructors
Environmental Laboratory
Boothwyn, PA

Sample Name : 204134B
Sample Information : 1ml/1ml ->
Data File Name : D:\HPCHEM\1\DATA\SPC11_10\L_SPC260.D
Analysis Method : D:\HPCHEM\1\METHODS\METH11A.M
Analysis Date : 11/10/1999
Injection Time : 2:59:19 PM
Aquisition Operator : JNK



#	Ret. T [min]	Compound Name	Area	Amount [ug/l]
1	1.269	methane	1083785.4	819.1

Q 11/10/99

Quantitation Report (QT Reviewed)

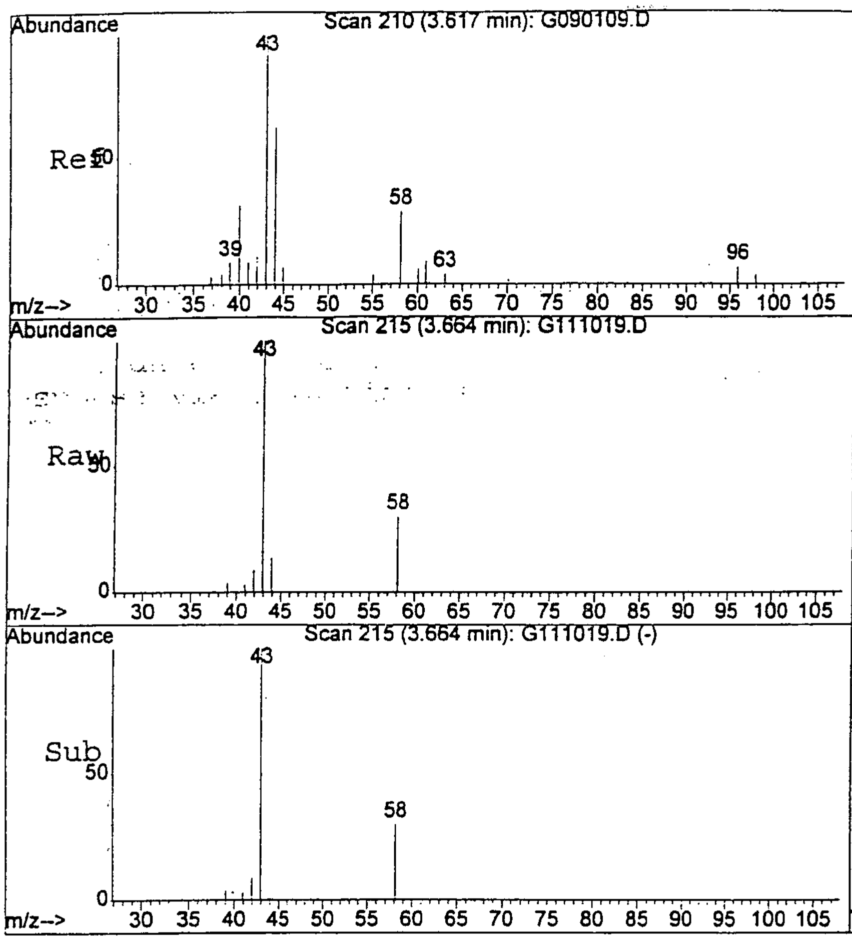
Data File : C:\HPCHEM\1\DATA\111099G1\G111019.D Vial: 28
Acq On : 10 Nov 1999 17:46 Operator: JAM
Sample : 204135A MW-9 Inst : GC/MS Ins
Misc : 10ML Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Nov 11 7:51 1999 Quant Results File: G110199.RES

Quant Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration
DataAcq Meth : G110199

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.42	168	282715	10.00	ug/L	0.03
23) 1,4-Difluorobenzene	8.57	114	425280	10.00	ug/L	0.03
36) Chlorobenzene-d5	13.40	117	271283	10.00	ug/L	0.04
54) 1,4-Dichlorobenzene-d4	17.52	152	100410	10.00	ug/L	0.03
System Monitoring Compounds						
20) Dibromofluoromethane	7.30	111	112980	11.04	ug/L	0.03
Spiked Amount 10.000			Recovery	=	110.40%	
37) Toluene-d8	10.96	98	367894	9.34	ug/L	0.03
Spiked Amount 10.000			Recovery	=	93.40%	
51) Bromofluorobenzene	15.46	95	108463	9.63	ug/L	0.03
Spiked Amount 10.000			Recovery	=	96.30%	
Target Compounds						Qvalue
10) Acetone	3.66	43	40292	29.40	ug/L #	69
12) Methyl-t-butyl Ether	4.83	73	30754	2.90	ug/L	95
13) Methylene Chloride	4.34	49	12484	1.18	ug/L	88
40) Toluene	11.07	91	291088	5.78	ug/L	100

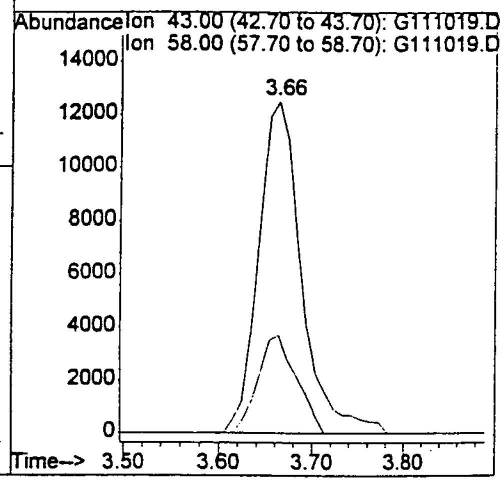
JAM
11-11-99

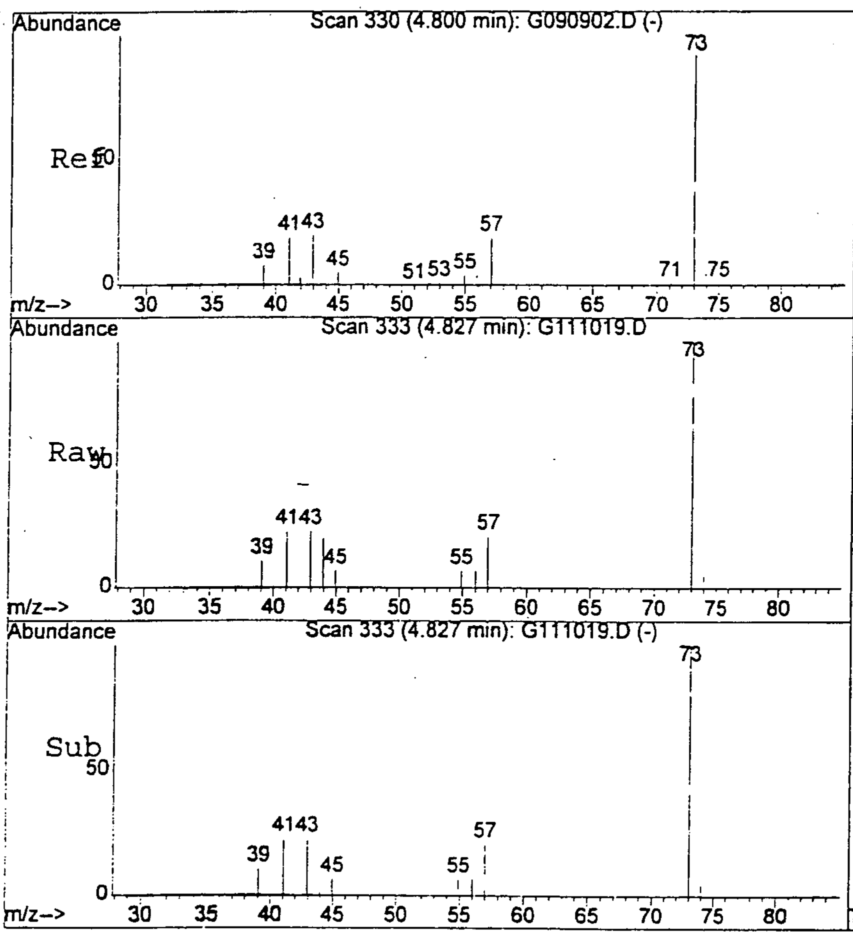
(#) = qualifier out of range (m) = manual integration



#10
Acetone
Concen: 29.40 ug/L
RT: 3.66 min Scan# 215
Delta R.T. 0.03 min
Lab File: G111019.D
Acq: 10 Nov 1999 17:46

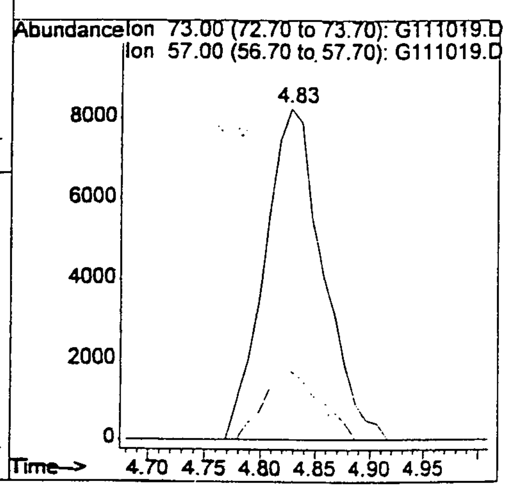
Tgt Ion: 43	Resp:		40292
Ion	Ratio	Lower	Upper
43	100		
58	26.6	11.1	16.7#





#12
Methyl-t-butyl Ether
Concen: 2.90 ug/L
RT: 4.83 min Scan# 333
Delta R.T. 0.03 min
Lab File: G111019.D
Acq: 10 Nov 1999 17:46

Tgt Ion: 73	Resp:		30754
Ion	Ratio	Lower	Upper
73	100		
57	20.0	14.3	21.5



Raytheon Engineers & Constructors

LABORATORY ORGANICS DATA SHEET

з SAMPLE #	: 204135B	ANALYSIS DATE	: 11/10/1999
MATRIX	: WATER	RECVD DATE	: 11/04/1999
CLIENT ID	: Ganes MW-9	ID FILE	: g16.id
Sample wt/vol	: 1ml	DATA FILE	: L_SPC261

	Compound	Result ug/L	Detection Limit ug/L
1	Methane	ND	20

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.00 SUMMARY 49065

Raytheon Raytheon Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

L_ SAMPLE # : 204136A
MATRIX : WATER
CLIENT ID : Ganes MW-8
Sample wt/vol : 25ML

ANALYSIS DATE : 11/09/1999
RECVD DATE : 11/04/1999
ID FILE : g1825.id
DATA FILE : G110916

	Compound	Result (ug/L)		Detection Limit (ug/L)
74-87-3	Chloromethane	ND		1
75-01-4	Vinyl Chloride	ND		1
74-83-9	Bromomethane	ND		1
75-00-3	Chloroethane	ND		1
75-35-4	1,1-Dichloroethene	ND		0.5
75-09-2	Methylene Chloride	ND	B	1
67-64-1	Acetone	13		5
156-59-2	cis-1,2-Dichloroethene	ND		0.5
75-34-3	1,1-Dichloroethane	ND		0.5
156-60-5	trans-1,2-Dichloroethene	ND		0.5
67-66-3	Chloroform	ND		0.5
78-93-3	2-Butanone	ND		5
55-6	1,1,1-Trichloroethane	ND		0.5
23-5	Carbon Tetrachloride	ND		0.5
15-0	Carbon Disulfide	ND		0.5
5 78-6	2-Hexanone	ND		5
108-10-1	4-Methyl-2-Pentanone	ND		5
78-87-5	1,2-Dichloropropane	ND		0.5
10061-02-6	trans-1,3-Dichloropropene	ND		0.5
10061-01-5	cis-1,3-Dichloropropene	ND		0.5
1634-04-4	Methyl-t-butyl Ether	1		0.5
71-43-2	Benzene	1		0.5
107-06-2	1,2-Dichloroethane	ND		0.5
79-01-6	Trichloroethene	ND		0.5
75-27-4	Bromodichloromethane	ND		0.5
108-88-3	Toluene	6		0.5
79-00-5	1,1,2-Trichloroethane	ND		0.5
079-34-5	1,1,2,2-Tetrachloroethane	ND		0.5
127-18-4	Tetrachloroethene	ND		0.5
124-48-1	Dibromochloromethane	ND		0.5
108-90-7	Chlorobenzene	ND		0.5
100-41-4	Ethylbenzene	1		0.5
330-20-7	m&p-Xylenes	1		0.5
95-47-6	o-Xylene	0.6		0.5
100-42-5	Styrene	ND		0.5
75-25-2	Bromoform	ND		1

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

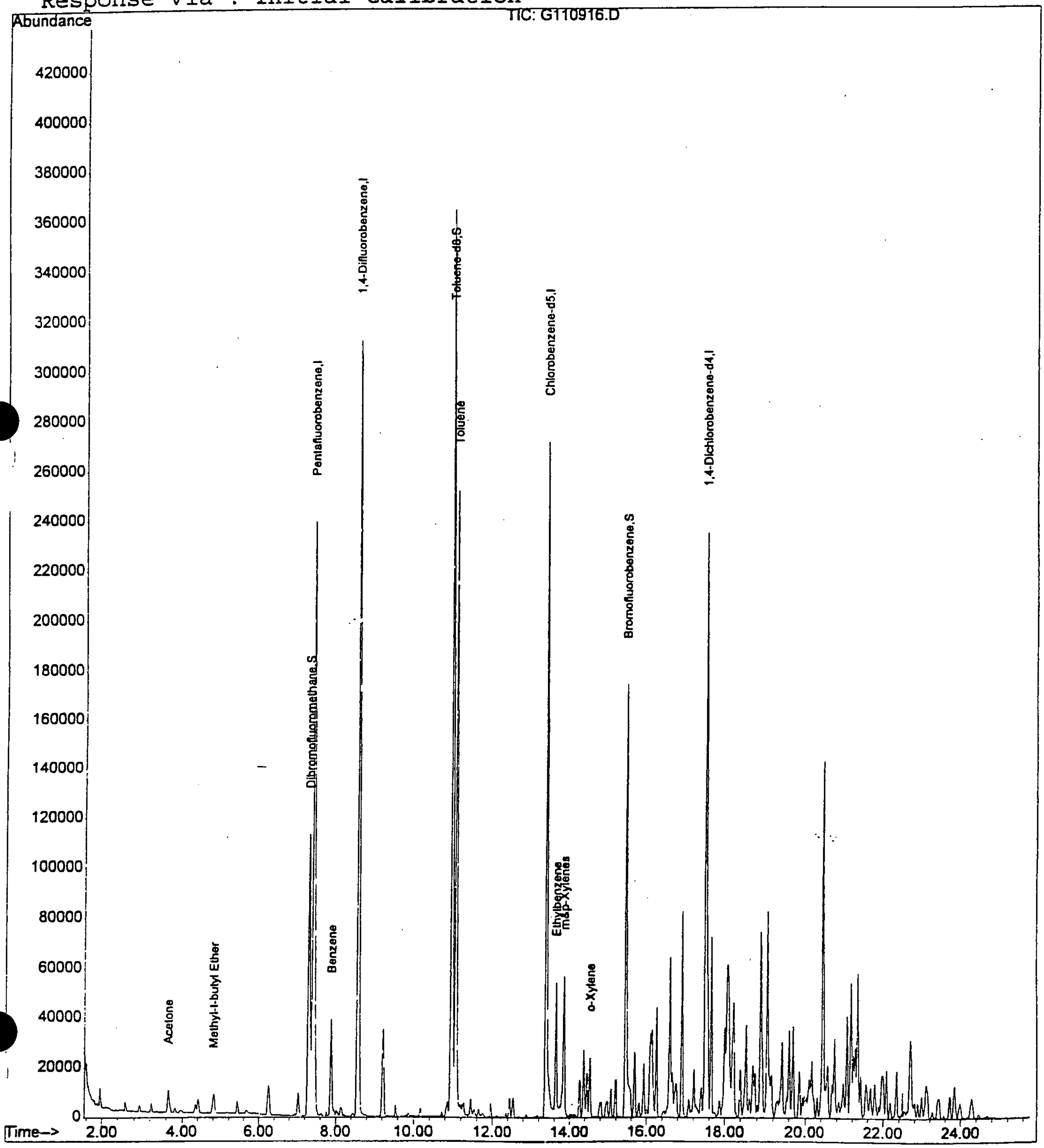
Quantitation Report

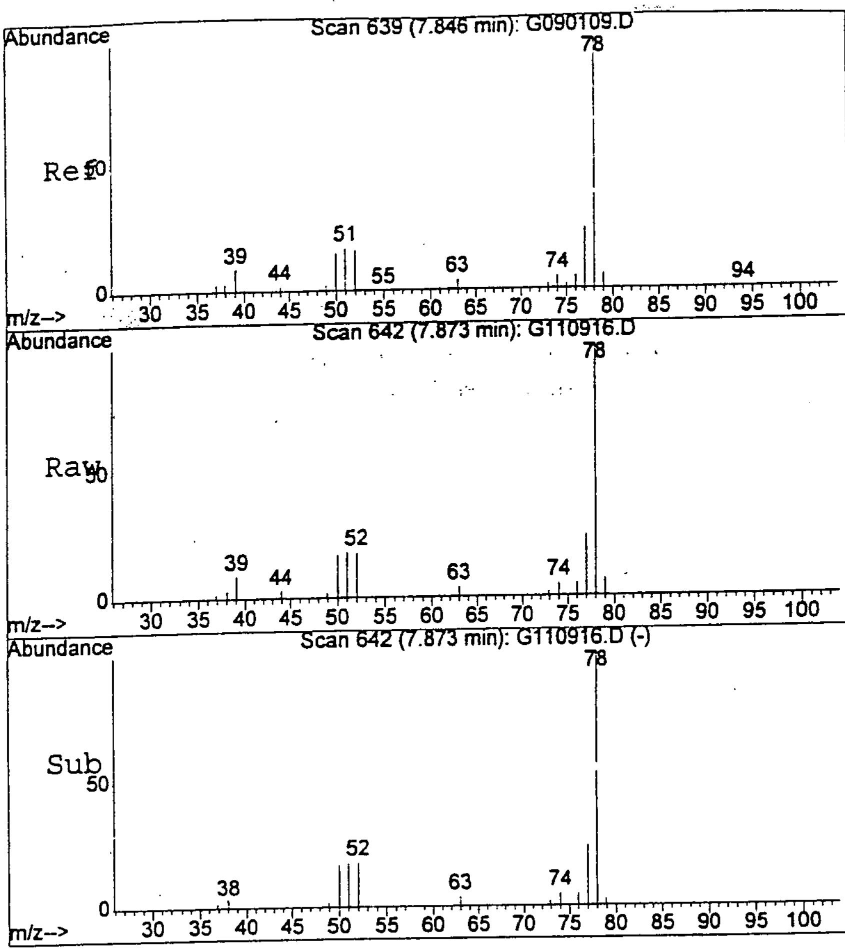
Data File : C:\HPCHEM\1\DATA\110999G1\G110916.D
Acq On : 9 Nov 1999 16:22
Sample : 204136A MW-8
Misc : 25ML
MS Integration Params: rteint.p
Quant Time: Nov 10 8:05 1999

Vial: 28
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

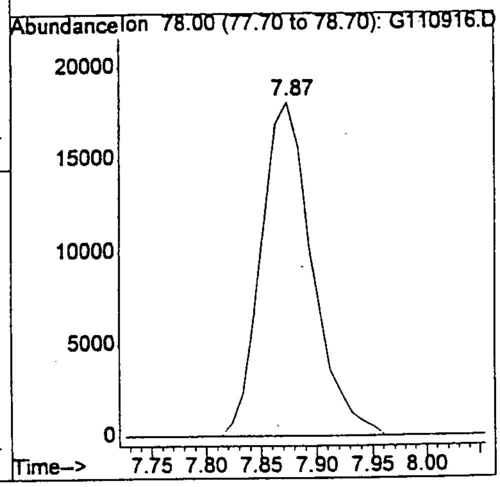
Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration

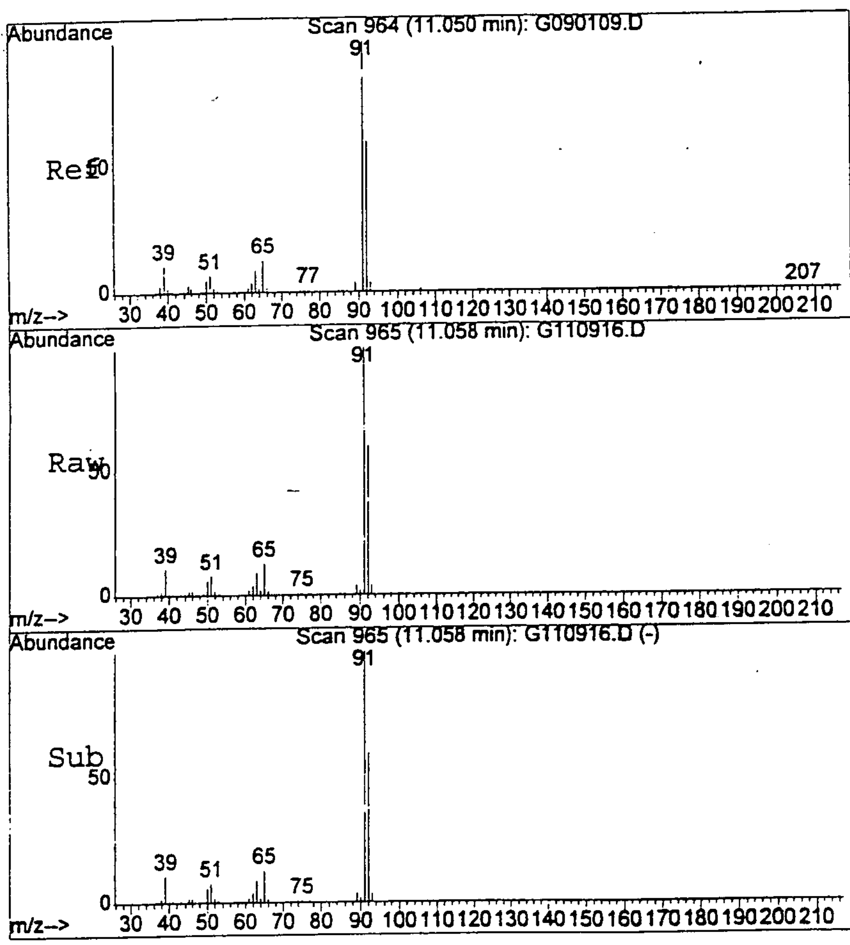




#27
Benzene
Concen: 1.17 ug/L
RT: 7.87 min Scan# 642
Delta R.T. 0.02 min
Lab File: G110916.D
Acq: 9 Nov 1999 16:22

Tgt Ion: 78 Resp: 58083

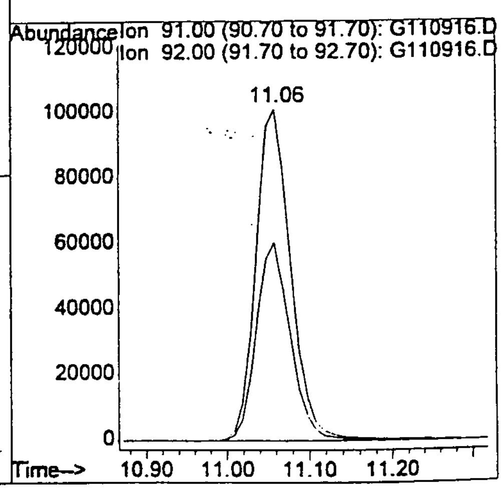


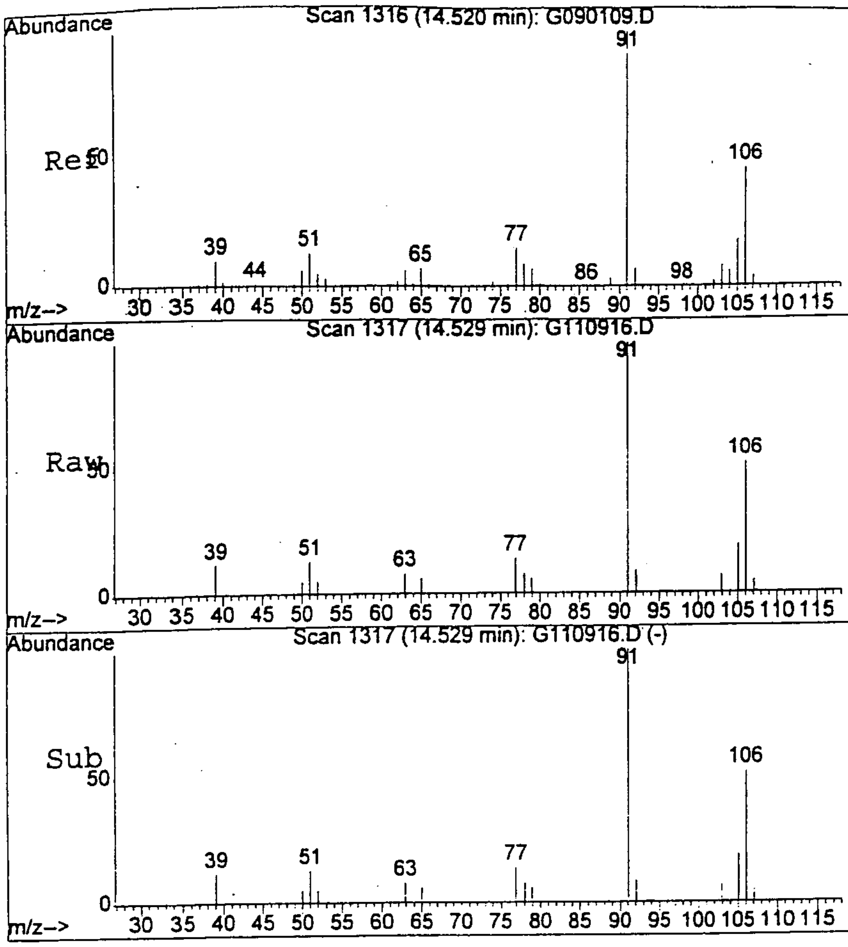


#40
Toluene
Concen: 6.22 ug/L
RT: 11.06 min Scan# 965
Delta R.T. 0.02 min
Lab File: G110916.D
Acq: 9 Nov 1999 16:22

Tgt Ion: 91 Resp: 298184

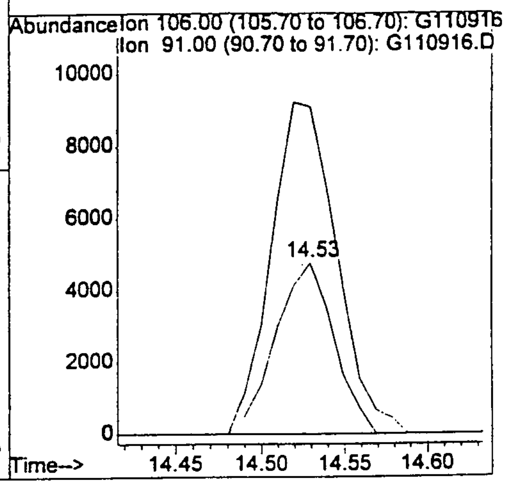
Ion	Ratio	Lower	Upper
91	100		
92	58.5	47.8	71.6





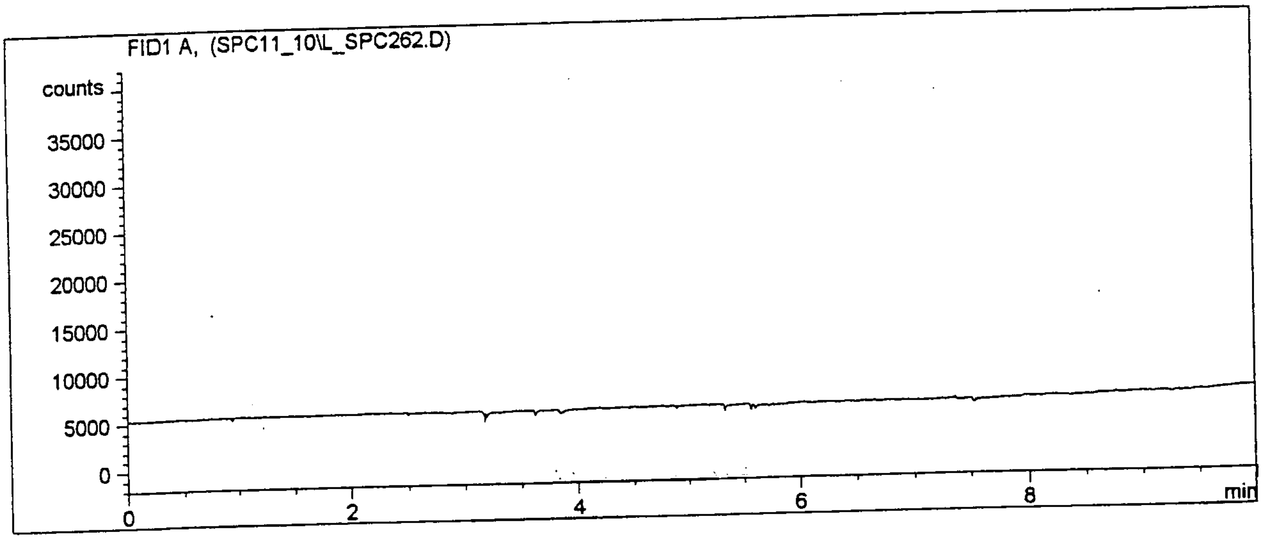
#48
o-Xylene
Concen: 0.64 ug/L
RT: 14.53 min Scan# 1317
Delta R.T. 0.02 min
Lab File: G110916.D
Acq: 9 Nov 1999 16:22

Tgt	Ion:106	Resp:	11632
Ion	Ratio	Lower	Upper
106	100		
91	216.5	209.4	314.0



Raytheon Engineers and Constructors
Environmental Laboratory
Boothwyn, PA

Sample Name : 204136B ->
Sample Information : 1ml/1ml
Data File Name : D:\HPCHEM\1\DATA\SPC11_10\L_SPC262.D
Analysis Method : D:\HPCHEM\1\METHODS\METH11A.M
Analysis Date : 11/10/1999
Injection Time : 3:28:03 PM
Aquisition Operator : JNK



#	Ret. T [min]	Compound Name	Area	Amount [ug/l]
1	0.000	methane	0.0	0.0

J 11/10/99

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\1\DATA\111099G1\G111012.D
Acq On : 10 Nov 1999 13:53
Sample : 204137A MW-4D
Misc : 0.25ML
Integration Params: rteint.p
Quant Time: Nov 10 14:52 1999

Vial: 26
Operator: JAM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: G110199.RES

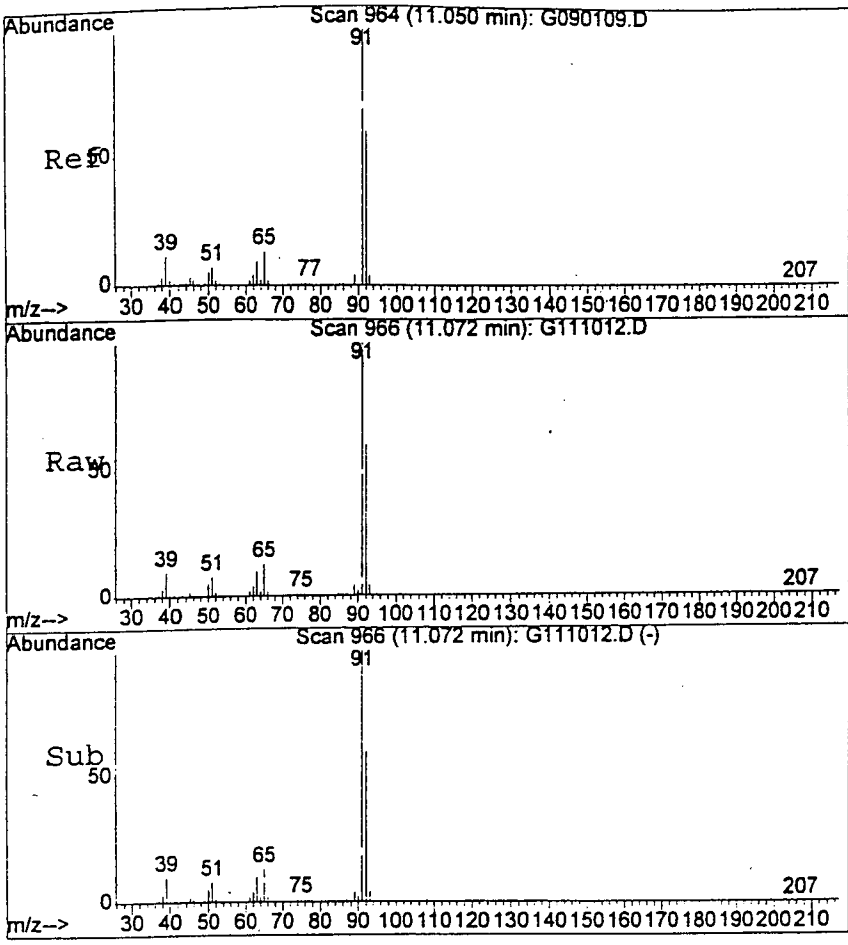
Quant Method : C:\HPCHEM\1\METHODS\G110199.M (RTE Integrator)
Title : 8260 25ml purge
Last Update : Mon Nov 01 14:24:24 1999
Response via : Initial Calibration
DataAcq Meth : G110199

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Pentafluorobenzene	7.41	168	287229	10.00 ug/L	0.02
23) 1,4-Difluorobenzene	8.57	114	433759	10.00 ug/L	0.02
36) Chlorobenzene-d5	13.39	117	281835	10.00 ug/L	0.03
54) 1,4-Dichlorobenzene-d4	17.52	152	127584	10.00 ug/L	0.03

System Monitoring Compounds	R.T.	QIon	Response	Conc Units	Dev(Min)
20) Dibromofluoromethane	7.30	111	115584	11.11 ug/L	0.02
Spiked Amount 10.000			Recovery =	111.10%	
37) Toluene-d8	10.95	98	384557	9.40 ug/L	0.02
Spiked Amount 10.000			Recovery =	94.00%	
51) Bromofluorobenzene	15.46	95	119995	10.26 ug/L	0.03
Spiked Amount 10.000			Recovery =	102.60%	

Target Compounds	R.T.	QIon	Response	Conc Units	Qvalue
10) Acetone	3.66	43	8296	5.96 ug/L #	79
13) Methylene Chloride	4.35	49	10480	0.98 ug/L	86
40) Toluene	11.07	91	1679790	32.09 ug/L	100

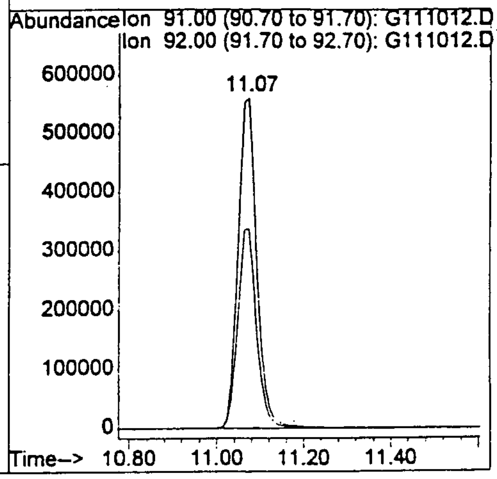
JAM
11-10-99



#40
Toluene
Concen: 32.09 ug/L
RT: 11.07 min Scan# 966
Delta R.T. 0.03 min
Lab File: G111012.D
Acq: 10 Nov 1999 13:53

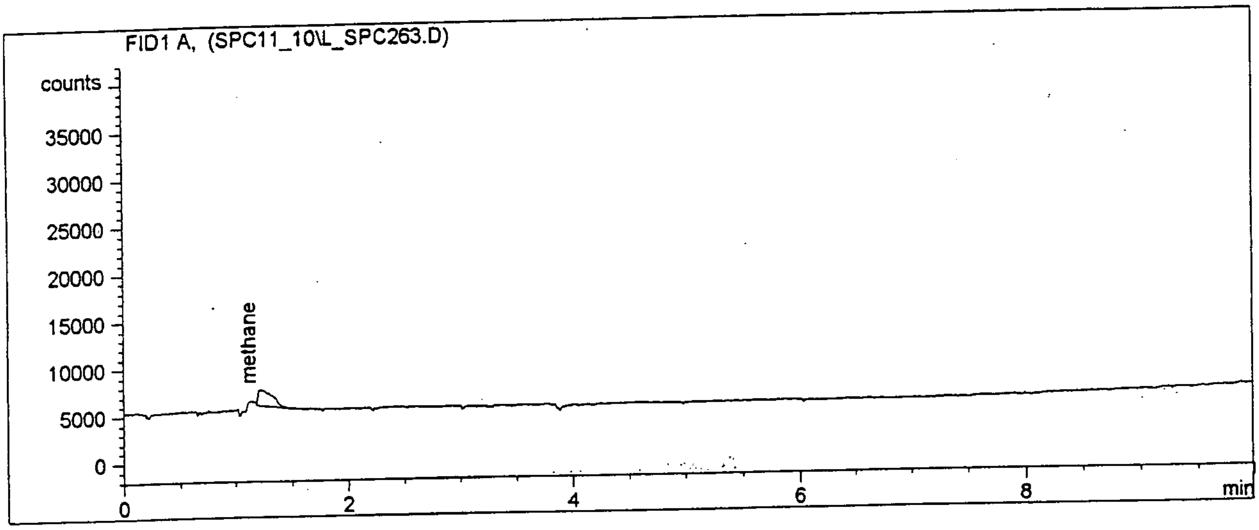
Tgt Ion: 91 Resp: 1679790

Ion	Ratio	Lower	Upper
91	100		
92	60.0	47.8	71.6



Raytheon Engineers and Constructors
Environmental Laboratory
Boothwyn, PA

Sample Name : 204137B
Sample Information : 1ml/1ml ->
Data File Name : D:\HPCHEM\1\DATA\SPC11_10\L_SPC263.D
Analysis Method : D:\HPCHEM\1\METHODS\METH11A.M
Analysis Date : 11/10/1999
Injection Time : 3:41:43 PM
Aquisition Operator : JNK



#	Ret. T [min]	Compound Name	Area	Amount [ug/l]
1	1.228	methane	16520.7	12.5

2 11/10/99

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Raytheon Environmental Lab Contract: ______

Lab Code: ______ Case No.: ______ SAS No.: ______ SDG No.: ______

	EPA SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	TOT OUT
01	VBLK1110	105	101	90	0
02	204314A	101	102	95	0
03	204317	105	97	98	0
04	204424C	109	98	94	0
05	204428	105	93	99	0
06	204307	103	98	103	0
07	204137A	111	94	103	0
08	204423C	109	96	96	0
09	204135A	110	93	96	0
10	204135AMS	105	88	94	0
11	204135AMSD	114	90	99	0

			QC LIMITS
SMC1	=	Dibromofluoromethane	(76-114)
SMC2	=	Toluene-d8	(88-110)
SMC3	=	Bromofluorobenzene	(86-115)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

QC Laboratories, 1205 Industrial Blvd., Southampton, PA 18966
Phone: 215-355-3900 *FAX: 215-355-7231*

FAST FAX ADVANCE ANALYTICAL RESULTS
Approved Analytical Report will follow by U. S. Mail or express carrier.

TO: Paul Michels
COMPANY: MCLAREN/HART
FAX PHONE: 1-610-567-1510

FROM: Amy Corr
SENT ON: Thu Dec 30 13:29:40 1999

NUMBER OF PAGES (Including Cover): 4

COMMENTS:

Have a happy new year.

PLEASE CALL NUMBER ABOVE IF FAX TRANSMISSION IS INCOMPLETE.

QC Laboratories

Analytical Results

12/30/99 01:28pm

Regarding:

AXEL SCHWENDT
MCLAREN/HART
470 NORRISTOWN ROAD
SUITE 300
BLUE BELL, PA 19422

AXEL SCHWENDT
MCLAREN/HART
470 NORRISTOWN ROAD
SUITE 300
BLUE BELL, PA 19422

Account No: B00196. MCLAREN/HART PA
Project No: B00196. MCLAREN/HART PA

P.O. No:
PWSID No:

Inv. No:

Sample Number	Sample Description	Samp. Date/Time/Temp	Sampled by
L607623-2	MW-10	12/21/99 10:00am NA°F	Customer Sampled

Parameter	Method	Result	RLs	Test Date
CHLOROMETHANE	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
VINYL CHLORIDE	EPA Method 8260	ND ug/l	50.0 ug/l	12/28/99
BROMOMETHANE	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
CHLOROETHANE	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
1,1-DICHLOROETHENE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
ACETONE	EPA Method 8260	ND ug/l	50.0 ug/l	12/28/99
CARBON DISULFIDE	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
METHYLENE CHLORIDE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
TRANS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
ACROLEIN	EPA Method 8260	ND ug/l	500. ug/l	12/28/99
ACRYLONITRILE	EPA Method 8260	ND ug/l	250. ug/l	12/28/99
1,1-DICHLOROETHANE	EPA Method 8260	ND ug/l	50.0 ug/l	12/28/99
VINYL ACETATE	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
CIS-1,2-DICHLOROETHENE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
2-BUTANONE	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
CHLOROFORM	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
1,1,1-TRICHLOROETHANE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
CARBON TETRACHLORIDE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
BENZENE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
1,2-DICHLOROETHANE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
TRICHLOROETHENE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
1,2-DICHLOROPROPANE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
BROMODICHLOROMETHANE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
2-CHLOROETHYL VINYL ETHER	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
CIS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/l	50.0 ug/l	12/28/99
4-METHYL-2-PENTANONE	EPA Method 8260	882. ug/l	100. ug/l	12/28/99
TOLUENE	EPA Method 8260	15.0 J ug/l	50.0 ug/l	12/28/99
TRANS-1,3-DICHLOROPROPENE	EPA Method 8260	ND ug/l	50.0 ug/l	12/28/99
1,1,2-TRICHLOROETHANE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
TETRACHLOROETHENE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
2-HEXANONE	EPA Method 8260	ND ug/l	100. ug/l	12/28/99
DIBROMOCHLOROMETHANE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
CHLOROBENZENE	EPA Method 8260	ND ug/l	20.0 ug/l	12/28/99
ETHYL BENZENE	EPA Method 8260	44.2 J ug/l	50.0 ug/l	12/28/99
M&P-XYLENES	EPA Method 8260	160. ug/l	20.0 ug/l	12/28/99
O-XYLENE	EPA Method 8260	91.3 ug/l	10.0 ug/l	12/28/99
STYRENE	EPA Method 8260	ND ug/l	50.0 ug/l	12/28/99
BROMOFORM	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99
1,1,2,2-TETRACHLOROETHANE	EPA Method 8260	ND ug/l	10.0 ug/l	12/28/99

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are: PADER 09-131;NJDEP 77166/77001(WindGap). additional states upon request.
Definitions: ND-not detected; NEG-negative; POS-positive; COL-colonies; RLs-laboratory reporting limits; L/A-laboratory accident;
TNTC-too numerous to count
A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

Allen D. Schopbach

Allen D. Schopbach, President

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

QC Laboratories

Analytical Results

12/30/99 01:28pm

Account No: B00196. MCLAREN/HART PA
Project No: B00196. MCLAREN/HART PA

P.O. No:
PWSID No:

Inv. No:

L607623-2:
1. QUALIFIERS: "B" is used when the compound is found in the blank as well as in the sample: "J" indicates an estimated value: "E" identifies compounds whose concentrations exceed the range of calibration of the instrument: "N" indicates presumptive evidence of a compound.

A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
QC INC's laboratory certification numbers are; PADER 09-131;NJDEP 77166/77001(WindGap). additional states upon request.
Definitions: ND-not detected; NEG-negative; POS-positive; COL-colonies; RLs-laboratory reporting limits; L/A-laboratory accident; TNTC-too numerous to count
A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.

Allen D. Schopbach, President

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231

Appendix F

ISOTECH Treatability Study Report

TREATABILITY STUDY REPORT

GANES CHEMICAL
CARLSTADT, NJ

NOVEMBER 22, 1999

PREPARED FOR

MCLAREN HART
470 NORRISTOWN RD.
SUITE 300
BLUE BELL, PA 19422

PREPARED BY

IN-SITU OXIDATIVE TECHNOLOGIES, INC.
51 EVERETT DRIVE, SUITE #A-10
WEST WINDSOR, NJ 08550

ISOTEC CASE NO. 800204

ISOTEC Treatability Study Report
Ganes Chemical
Carlstadt, NJ
ISOTEC Case #800204

1.0 SUMMARY

In-Situ Oxidative Technologies, Inc. (ISOTEC[SM]) was retained by McLaren Hart, Inc. to conduct a laboratory treatability study on site-specific groundwater samples collected from the Ganes Chemical facility in Carlstadt, NJ. The primary organic contaminant of concern is toluene at a concentration of approximately 335,000 ppb. Results of the laboratory treatability study indicated greater than 99.9% destruction of the total volatile organic compounds (VOC's) in the groundwater test in samples analyzed using ISOTEC's proprietary oxidation method.

2.0 INTRODUCTION

ISOTEC utilized their proprietary Fenton-based process (ISOTEC[SM] Process) to treat organic contaminants in groundwater samples identified as "MW-4". ISOTEC initially tested the contaminant noted in the samples through a series of oxidation laboratory studies. Based on successful laboratory study results, a pilot program can be designed specifically for a site to apply the ISOTEC remedial technology to the areas of concern evaluated during the laboratory study. From a successful pilot, full-scale remediation of an entire contaminant plume can be proposed, if necessary, through the issuance of a remedial workplan. The ISOTEC approach works via the in-situ destruction of contaminants, while creating minimal disturbance to site operations.

3.0 LABORATORY STUDY

ISOTEC performed a laboratory bench-scale treatability study to achieve the following objectives:

- Evaluate the effectiveness of ISOTEC's Fenton-based oxidation on "site-specific" groundwater samples.
- Conduct bench-scale testing using various catalyst/oxidizer amendments to determine the site-specific stoichiometry.
- Minimize volatile losses by conducting the bench tests in sealed reactor vessels.

4.0 SAMPLE COLLECTION

Groundwater samples from the Ganes Chemical facility identified as "MW-4" were taken on November 2, 1999 and shipped to ISOTEC's research laboratory to be used in a treatability experiment. The groundwater was collected from an on-site monitoring well exhibiting high contamination and stored in nine (9) 1 liter glass containers with zero headspace and no preservative. In addition, samples were collected in three (3) 40-ml vials preserved in HCl for bench test control purposes. All sample containers were stored at 4°C until laboratory analysis.

TABLE OF CONTENTS

APPENDICES

5.0 TREATABILITY STUDY

5.1 REACTION VESSEL PREPARATION

The laboratory treatability experiment [hereinafter referred to as "Groundwater Test" (GW-test)] was performed on groundwater samples identified as MW-4. Test samples were set up in 140 ml sealed batch reactors. For each reactor, adequate groundwater was introduced leaving enough headspace for predetermined reagent volumes to be injected. The vials were sealed with aluminum caps fitted with Teflon®-lined rubber septa to facilitate subsequent injections of reagent.

5.2 BENCH TEST CONTROLS

For the contaminant treatability experiment, two sets of control samples (Control-Reg and Control-Oxy) were set up to evaluate losses due to volatilization.

5.2.1 Control-REG

The first Control (Control-REG) was set up by isolating one of the reaction vials and subjecting to equivalent doses of distilled water to compensate for reagent volumes injected into treatment vials. The control vial remained at and was subject to the same conditions as the treatment vials. This control documented (a) Contaminant losses due to sample dilution by reagent volumes injected, and (b) Contaminant losses due to volatilization caused by room temperature test conditions.

5.2.2 Control-OXY

The second control (Control-OXY) was set up by isolating another reaction vial and introducing hydrogen peroxide and catalase. Catalase is an organic enzyme catalyst naturally present in most soils that decomposes hydrogen peroxide directly to oxygen <u>without</u> generating hydroxyl radicals as shown below.

$$H_2O_2 \rightarrow H_2O + \tfrac{1}{2}\,O_2$$

The resulting oxygen gas generated maintained the control vial at pressures that are significantly greater than the treatment vial pressures. The total volume of external reagent solution utilized was equalized by injecting adequate volume of distilled water as was necessary. Therefore, Control-OXY documents abiotic losses such as the following: (a) Contaminant losses due to volatilization caused by gases generated during the reaction, (b) Contaminant losses due to reaction conditions (i.e. temperature), and (c) Contaminant losses due to sample dilution by reagent volumes injected.

5.3 BENCH TEST TREATMENTS

The treatability study experiments were performed by injecting a series of catalyst and oxidizer amendments into the reaction vessels. The stoichiometric molar ratio of the reagent combination utilized was different in each reaction vessel. The total volume of external reagent solution utilized in each treatment vessel was equalized by injecting adequate volume of distilled water as was necessary. The laboratory study monitoring was conducted by setting up parallel vessels which received the same doses as the corresponding main reaction vessels. Samples were periodically withdrawn from the monitoring vessels for hydrogen peroxide analysis. Additional treatments to designated reaction vessels were injected based on residual peroxide concentrations remaining.

Following the last treatment, all reaction vessels remained undisturbed at room temperature for 24 hours or until such time that the oxidizer was completely consumed (as determined by Hach H_2O_2 testing equipment and/or by Quantofix® peroxide test sticks). The treatability study was terminated by spiking excess catalase into all the reaction vessels and the control vessels to decompose any residual hydrogen peroxide. Water from each of the GW-test reaction vials was decanted into 40-ml glass vials for subsequent volatile organic analyses.

5.3.1 ISOTEC Cat 4260

ISOTEC's patented series catalyst Cat-4260 is a circum-neutral pH (e.g. 5-8) organometallic complex with high mobility within the subsurface. Upon evaluating the site characteristics, ISOTEC chooses a specific series catalyst to perform the majority of experiments on. Based on historical contaminant levels noted at the site and previous experience with treatment of compounds of concern, the lab study utilized three stoichiometric molar ratios of 1, 2, and 3 treatment dosages of the Cat-4260 catalyst for this treatability test.

5.3.2 ISOTEC Cat 3000

ISOTEC's proprietary series catalyst Cat-3000 is acidic based (e.g. pH 2-3) organometallic complex with conditions similar to conventional Fenton's treatment. One test utilizing a stoichiometric molar ratio of 1 treatment dosages of the Cat-3000 catalyst is performed to evaluate this catalyst. Again, the number of treatment dosages is based on historical contaminant levels noted at the site and previous experience with treatment of compounds of concern.

5.4 BENCH TEST SAMPLES

The samples generated from the groundwater treatability study included the following:

- The 40 ml vial "Field" collected groundwater sample ("MW-4");
- The "Control-REG" sample of groundwater from the GW-test reactor vessel to which only distilled water was injected;
- The "Control-OXY" sample of groundwater from the GW-test reactor vessel to which only hydrogen peroxide and catalase were injected;
- The "Treated" samples of groundwater from the GW-test reactor vessels to which varying volumes of catalyst and hydrogen peroxide were injected (4 samples); and
- The "Field" collected groundwater samples for dissolved iron (Fe) and total organic carbon (TOC) analysis.

5.5 SAMPLE ANALYSES

The VOC concentrations were determined using EPA method 624+10 by a New Jersey State certified laboratory.

5.6 SAMPLE CHARACTERISTICS

Table #1 delineates the native groundwater dissolved iron and total organic carbon (TOC) concentrations and pH.

Table 1: Sample Characteristics

Sample	Matrix	Iron (Fe), dissolved ppm	TOC ppm	pH
MW-4	Aqueous	0.094	4.59	6.51

Table #2 reflects the results of volatile organic analysis performed on "Field" collected groundwater sample ("MW-4"). Please note that the laboratory-collected samples may reflect lower concentrations compared to the field-collected samples due to the laboratory mechanics of sample preparation, transfer and room temperature test conditions.

Table 2: Results of Volatile Organic Analysis of MW-4 "Field" Sample

Compound (ppb)	"Field" MW-4
toluene	335,000
Total VOC's	335,000
Total TIC's	ND
Total VOC's & TIC's	335,000

- ND = Not detected in analysis
- VOC's=Volatile organic compounds
- TIC's = Tentatively Identified Compounds

5.7 TREATABILITY STUDY RESULTS

The laboratory study results shown in **Table 3** indicate greater than 99.9% destruction of total volatile organic compounds detected within the groundwater sample using Catalyst 4260. As may be seen from the table, Catalyst 3000 was also effective on the contaminants of concern. It may be noted from the final pH values that Catalyst 4260 has a circum-neutral pH and is designed for natural subsurface conditions and Catalyst 3000 is acid based and therefore, has low pH values. It is clear that ISOTEC's <u>minimum</u> treatment using Catalyst 4260 (1-Treatment) was adequate to achieve 99.9% destruction of total VOC's.

Based upon high residual levels of toluene detected in Control-OXY, it is clear the abiotic controls promoted by organic enzyme catalysts such as catalase were not effective for contaminant destruction. In addition, a comparison of the results presented in **Tables 2 and 3** indicate that volatilization losses were kept to a minimum (18%). **Appendix 1** includes a complete copy of the analytical package.

Table 3: Results of Groundwater Test Treatment"

Water Analysis – EPA Method 624						
Sample ID	Control-REG	Control-OXY	Treated	Treated	Treated	Treated
Catalyst Used	None	Catalase	Cat-4260	Cat-4260	Cat-4260	Cat-3000
Oxidant Used	None	Stab. H_2O_2	Stab. H_2O_2	Stab. H_2O_2	Stab. H_2O_2	Stab. H_2O_2
No. of Treatments	0	1	1	2	3	2
Compound (ppb)						
Toluene	274,000 *	305,000 *	1.74	1.49	12.1	ND(<1.25)
Bromoform	ND(<340)	ND(<340)	1.4	1.21	2.26	258
Total VOC's	274,000	305,000	6.16	6.6	15.2	268.9
Total TIC's	ND	ND	206.7	153.3	70	65
Total VOC's & TIC's	**274,000**	**305,000**	**212.9**	**159.9**	**85.2**	**333.9**
% Reduction	-	-	**>99.9%**	**>99.9%**	**>99.9%**	**99.9%**
Final pH	**6.51**	**6.47**	**5.73**	**5.81**	**5.98**	**2.25**

Note:
- VOC's = Volatile Organic Compounds
- TIC's = Tentatively Identified Compounds
- * = Results from diluted analysis
- ND<(MDL) = Concentration not detected below method detection limit (MDL)

5.8 CONCLUSIONS FROM TREATABILITY STUDY

Laboratory study results indicate that the ISOTEC[SM] process is effective on the contaminant of concern at the site (i.e. toluene). Results of control samples indicate that volatilization losses remained minimal. In addition, abiotic control mechanisms promoted by natural organic catalysts were found to be ineffective for VOC destruction in the groundwater sample. The minimum treatment application using Catalyst 4260 demonstrated greater than 99.9% reduction of total VOC's in groundwater. Therefore, ISOTEC's catalytic treatment reaction greatly improved the generation of hydroxyl radicals and hence, resulted in highly effective contaminant destruction in groundwater from the Ganes Chemical facility in Carlstadt, NJ..

6.0 SITE CHARACTERISTICS

A preliminary assessment of site-specific factors affecting ISOTEC's process was performed based on the native groundwater dissolved iron and total organic carbon (TOC) content. The dissolved iron content was detected at a low concentration of 0.094-ppm (Table 1). ISOTEC's pilot program takes this level into account in determining initial pilot program reagent quantities. The concentration of TOC (4.59 ppm) detected in the site groundwater will not promote a significant side reaction.

7.0 PILOT PROGRAM

Based on the successful ISOTEC lab study results received, an ISOTEC pilot program can be performed at the site: (1) to gather additional data to evaluate the effectiveness of this remedial alternative; (2) as an initial step toward remediating the site; and (3) to substantially reduce the organic loading in the areas treated. The treatment program will consist of introducing ISOTEC's proprietary series Catalyst 4260, oxidizer and mobility control agents into the subsurface over a short time period. A proposal will be forwarded shortly outlining proposed scope of work and associated costs for an ISOTEC pilot program.

APPENDIX #1

LAB STUDY ANALYTICAL PACKAGE

Integrated Analytical Labs

Integrated Analytical Laboratories, LLC.

273 Franklin Road
Randolph, N.J. 07869

Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT
for
Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550
Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Volatiles

Lab ID: 6734-001
Client ID: FIELD-MW-4
Matrix-Units: Aqueous-μg/L
Percent Moisture: 100

Date Sampled: 11/3/99
Time Sampled: NA
Date Analyzed: 11/10/99

Compound	Conc	Q	MDL
Chloromethane	ND		620
Vinyl Chloride	ND		850
Bromomethane	ND		790
Chloroethane	ND		870
Trichlorofluoromethane	ND		1240
Acrolein	ND		4970
1,1-Dichloroethene	ND		760
Methylene Chloride	ND		1950
Acrylonitrile	ND		2450
trans-1,2-Dichloroethene	ND		540
1,1-Dichloroethane	ND		480
Chloroform	ND		400
1,1,1-Trichloroethane	ND		710
Carbon Tetrachloride	ND		930
1,2-Dichloroethane(EDC)	ND		280
Benzene	ND		310
Trichloroethene	ND		540
1,2-Dichloropropane	ND		310
Bromodichloromethane	ND		200
2-Chloroethylvinyl Ether	ND		390
cis-1,3-Dichloropropene	ND		170
Toluene	335000	*	1250
trans-1,3-Dichloropropene	ND		140
1,1,2-Trichloroethane	ND		230
Tetrachloroethene	ND		650
Dibromochloromethane	ND		200
Chlorobenzene	ND		170
Ethylbenzene	ND		250
Total Xylenes	ND		760
Bromoform	ND		340
1,1,2,2-Tetrachloroethane	ND		370
1,3-Dichlorobenzene	ND		140
1,4-Dichlorobenzene	ND		200
1,2-Dichlorobenzene	ND		170
TOTAL VO's:	335000		
TOTAL TIC's:	ND		
TOTAL VO's & TIC's:	335000		

ND = Analyzed for but Not Detected at the MDL
* = Result from diluted analysis.

New Jersey Certified Lab # 14751

New York Certified Lab # 11402

Integrated Analytical Labs

Integrated Analytical Laboratories, LLC.

273 Franklin Road
Randolph, N.J. 07869

Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT
for
Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550
Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Metals

Lab ID: 6734-001
Client ID: FIELD-MW-4
Matrix-Units: Aqueous-mg/L
Percent Moisture: 100

Date Sampled: 11/3/99
Time Sampled: NA
Date Analyzed: 11/11/99

Parameter	Result	Q	MDL
Iron	0.094		0.050

General Analytical

Lab ID: 6734-001
Client ID: FIELD-MW-4
Percent Moisture: 100

Date Sampled: 11/3/99
Time Sampled: NA

Parameter	Result	MDL	Matrix-Units	Date Analyzed
Total Organic Carbons	4.59	1	Aqueous-mg/L	11/9/99

Integrated Analytical Laboratories, LLC.
273 Franklin Road
Randolph, N.J. 07869
Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT

for
Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550
Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Volatiles

Lab ID: 6734-002
Client ID: GW/C-REG
Matrix-Units: Aqueous-$\mu g/L$
Percent Moisture: 100

Date Sampled: 11/8/99
Time Sampled: 09:20
Date Analyzed: 11/10/99

Compound	Conc	Q	MDL
Chloromethane	ND		620
Vinyl Chloride	ND		850
Bromomethane	ND		790
Chloroethane	ND		870
Trichlorofluoromethane	ND		1240
Acrolein	ND		4970
1,1-Dichloroethene	ND		760
Methylene Chloride	ND		1950
Acrylonitrile	ND		2450
trans-1,2-Dichloroethene	ND		540
1,1-Dichloroethane	ND		480
Chloroform	ND		400
1,1,1-Trichloroethane	ND		710
Carbon Tetrachloride	ND		930
1,2-Dichloroethane(EDC)	ND		280
Benzene	ND		310
Trichloroethene	ND		540
1,2-Dichloropropane	ND		310
Bromodichloromethane	ND		200
2-Chloroethylvinyl Ether	ND		390
cis-1,3-Dichloropropene	ND		170
Toluene	274000	*	1250
trans-1,3-Dichloropropene	ND		140
1,1,2-Trichloroethane	ND		230
Tetrachloroethene	ND		650
Dibromochloromethane	ND		200
Chlorobenzene	ND		170
Ethylbenzene	ND		250
Total Xylenes	ND		760
Bromoform	ND		340
1,1,2,2-Tetrachloroethane	ND		370
1,3-Dichlorobenzene	ND		140
1,4-Dichlorobenzene	ND		200
1,2-Dichlorobenzene	ND		170
TOTAL VO's:	274000		
TOTAL TIC's:	ND		
TOTAL VO's & TIC's:	274000		

ND = Analyzed for but Not Detected at the MDL
* = Result from diluted analysis.

New Jersey Certified Lab # 14751

New York Certified Lab # 11402

Integrated Analytical Labs

Integrated Analytical Laboratories, LLC.

273 Franklin Road
Randolph, N.J. 07869

Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT

for
Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550
Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Volatiles

Lab ID: 6734-003
Client ID: GW/C-OXY
Matrix-Units: Aqueous-$\mu g/L$
Percent Moisture: 100

Date Sampled: 11/8/99
Time Sampled: 09:25
Date Analyzed: 11/10/99

Compound	Conc	Q	MDL
Chloromethane	ND		620
Vinyl Chloride	ND		850
Bromomethane	ND		790
Chloroethane	ND		870
Trichlorofluoromethane	ND		1240
Acrolein	ND		4970
1,1-Dichloroethene	ND		760
Methylene Chloride	ND		1950
Acrylonitrile	ND		2450
trans-1,2-Dichloroethene	ND		540
1,1-Dichloroethane	ND		480
Chloroform	ND		400
1,1,1-Trichloroethane	ND		710
Carbon Tetrachloride	ND		930
1,2-Dichloroethane(EDC)	ND		280
Benzene	ND		310
Trichloroethene	ND		540
1,2-Dichloropropane	ND		310
Bromodichloromethane	ND		200
2-Chloroethylvinyl Ether	ND		390
cis-1,3-Dichloropropene	ND		170
Toluene	305000	*	1250
trans-1,3-Dichloropropene	ND		140
1,1,2-Trichloroethane	ND		230
Tetrachloroethene	ND		650
Dibromochloromethane	ND		200
Chlorobenzene	ND		170
Ethylbenzene	ND		250
Total Xylenes	ND		760
Bromoform	ND		340
1,1,2,2-Tetrachloroethane	ND		370
1,3-Dichlorobenzene	ND		140
1,4-Dichlorobenzene	ND		200
1,2-Dichlorobenzene	ND		170
TOTAL VO's:	305000		
TOTAL TIC's:	ND		
TOTAL VO's & TIC's:	305000		

ND = Analyzed for but Not Detected at the MDL
* = Result from diluted analysis.

Integrated Analytical Labs

Integrated Analytical Laboratories, LLC.

273 Franklin Road
Randolph, N.J. 07869

Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT

for

Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550
Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Volatiles

Lab ID: 6734-004
Client ID: GW/T-A
Matrix-Units: Aqueous-$\mu g/L$
Percent Moisture: 100

Date Sampled: 11/8/99
Time Sampled: 09:28
Date Analyzed: 11/10/99

Compound	Conc	Q	MDL
Chloromethane	0.746		0.62
Vinyl Chloride	ND		0.85
Bromomethane	2.27		0.79
Chloroethane	ND		0.87
Trichlorofluoromethane	ND		1.24
Acrolein	ND		4.97
1,1-Dichloroethene	ND		0.76
Methylene Chloride	ND		1.95
Acrylonitrile	ND		2.45
trans-1,2-Dichloroethene	ND		0.54
1,1-Dichloroethane	ND		0.48
Chloroform	ND		0.4
1,1,1-Trichloroethane	ND		0.71
Carbon Tetrachloride	ND		0.93
1,2-Dichloroethane(EDC)	ND		0.28
Benzene	ND		0.31
Trichloroethene	ND		0.54
1,2-Dichloropropane	ND		0.31
Bromodichloromethane	ND		0.2
2-Chloroethylvinyl Ether	ND		0.39
cis-1,3-Dichloropropene	ND		0.17
Toluene	1.74		0.25
trans-1,3-Dichloropropene	ND		0.14
1,1,2-Trichloroethane	ND		0.23
Tetrachloroethene	ND		0.65
Dibromochloromethane	ND		0.2
Chlorobenzene	ND		0.17
Ethylbenzene	ND		0.25
Total Xylenes	ND		0.76
Bromoform	1.4		0.34
1,1,2,2-Tetrachloroethane	ND		0.37
1,3-Dichlorobenzene	ND		0.14
1,4-Dichlorobenzene	ND		0.2
1,2-Dichlorobenzene	ND		0.17
TOTAL VO's:	6.156		
TOTAL TIC's:	206.7		
TOTAL VO's & TIC's:	212.856		

ND = Analyzed for but Not Detected at the MDL

INTEGRATED ANALYTICAL LABORATORIES

VOLATILE ORGANICS

Tentatively Identified Compounds

Client/Project: ISOTEC/MCLAREN HART

Lab ID: 6734-004
Client ID: GW/T-A
Date Received: 11/08/1999
Date Analyzed: 11/10/1999
Date File: G6483.D

GC/MS Column: DB-624
Sample wt/vol: 5ml
Matrix-Units: Aqueous-μg/L (ppb)
Dilution Factor: 1
% Moisture: 100

CAS #	Compound	Estimated Concentration	Retention Time
	Unknown	101	2.78
000067-64-1	Acetone	54.3	4.41
	Unknown	4.4	5.32
	Unknown	3.9	6.51
	Unknown	9.3	8.90
	Unknown	28.1	10.60
	Unknown	5.7	13.24

Total TICs = 206.7

INTEGRATED ANALYTICAL LABORATORIES

VOLATILE ORGANICS

Tentatively Identified Compounds

Client/Project: ISOTEC/MCLAREN HART

Lab ID: 6734-005
Client ID: GW/T-B
Date Received: 11/08/1999
Date Analyzed: 11/10/1999
Date File: G6484.D

GC/MS Column: DB-624
Sample wt/vol: 5ml
Matrix-Units: Aqueous-μg/L (ppb)
Dilution Factor: 1
% Moisture: 100

CAS #	Compound	Estimated Concentration	Retention Time
	Unknown	43.3	2.78
000067-64-1	Acetone	56.6	4.41
	Unknown	19.6	5.31
	Unknown	8.4	6.49
	Unknown	5.5	8.90
	Unknown	19.9	10.60

Total TICs = 153.3

Integrated Analytical Labs

Integrated Analytical Laboratories, LLC.

273 Franklin Road
Randolph, N.J. 07869

Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT
for
Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550
Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Volatiles

Lab ID: 6734-006
Client ID: GW/T-C
Matrix-Units: Aqueous-$\mu g/L$
Percent Moisture: 100

Date Sampled: 11/8/99
Time Sampled: 09:36
Date Analyzed: 11/10/99

Compound	Conc	Q	MDL
Chloromethane	0.825		0.62
Vinyl Chloride	ND		0.85
Bromomethane	ND		0.79
Chloroethane	ND		0.87
Trichlorofluoromethane	ND		1.24
Acrolein	ND		4.97
1,1-Dichloroethene	ND		0.76
Methylene Chloride	ND		1.95
Acrylonitrile	ND		2.45
trans-1,2-Dichloroethene	ND		0.54
1,1-Dichloroethane	ND		0.48
Chloroform	ND		0.4
1,1,1-Trichloroethane	ND		0.71
Carbon Tetrachloride	ND		0.93
1,2-Dichloroethane(EDC)	ND		0.28
Benzene	ND		0.31
Trichloroethene	ND		0.54
1,2-Dichloropropane	ND		0.31
Bromodichloromethane	ND		0.2
2-Chloroethylvinyl Ether	ND		0.39
cis-1,3-Dichloropropene	ND		0.17
Toluene	12.1		0.25
trans-1,3-Dichloropropene	ND		0.14
1,1,2-Trichloroethane	ND		0.23
Tetrachloroethene	ND		0.65
Dibromochloromethane	ND		0.2
Chlorobenzene	ND		0.17
Ethylbenzene	ND		0.25
Total Xylenes	ND		0.76
Bromoform	2.26		0.34
1,1,2,2-Tetrachloroethane	ND		0.37
1,3-Dichlorobenzene	ND		0.14
1,4-Dichlorobenzene	ND		0.2
1,2-Dichlorobenzene	ND		0.17
TOTAL VO's:	15.185		
TOTAL TIC's:	70		
TOTAL VO's & TIC's:	85.185		

ND = Analyzed for but Not Detected at the MDL

INTEGRATED ANALYTICAL LABORATORIES

VOLATILE ORGANICS
Tentatively Identified Compounds

Client/Project: ISOTEC/MCLAREN HART

Lab ID: 6734-006
Client ID: GW/T-C
Date Received: 11/08/1999
Date Analyzed: 11/10/1999
Date File: G6485.D

GC/MS Column: DB-624
Sample wt/vol: 5ml
Matrix-Units: Aqueous-μg/L (ppb)
Dilution Factor: 1
% Moisture: 100

CAS #	Compound	Estimated Concentration	Retention Time
	Unknown	6.9	2.78
000067-64-1	Acetone	32.3	4.41
	Unknown	4.3	5.31
	Unknown	10.3	6.51
	Unknown	4.1	8.90
	Unknown	12.1	10.60

Total TICs = 70

Integrated Analytical Labs

Integrated Analytical Laboratories, LLC.

273 Franklin Road
Randolph, N.J. 07869

Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT

for

Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550

Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Volatiles

Lab ID: 6734-007
Client ID: GW/T-D
Matrix-Units: Aqueous-μg/L
Percent Moisture: 100

Date Sampled: 11/8/99
Time Sampled: 09:39
Date Analyzed: 11/10/99

Compound	Conc	Q	MDL
Chloromethane	ND		3.1
Vinyl Chloride	ND		4.25
Bromomethane	10.9		3.95
Chloroethane	ND		4.35
Trichlorofluoromethane	ND		6.2
Acrolein	ND		24.9
1,1-Dichloroethene	ND		3.8
Methylene Chloride	ND		9.75
Acrylonitrile	ND		12.3
trans-1,2-Dichloroethene	ND		2.7
1,1-Dichloroethane	ND		2.4
Chloroform	ND		2
1,1,1-Trichloroethane	ND		3.55
Carbon Tetrachloride	ND		4.65
1,2-Dichloroethane(EDC)	ND		1.4
Benzene	ND		1.55
Trichloroethene	ND		2.7
1,2-Dichloropropane	ND		1.55
Bromodichloromethane	ND		1
2-Chloroethylvinyl Ether	ND		1.95
cis-1,3-Dichloropropene	ND		0.85
Toluene	ND		1.25
trans-1,3-Dichloropropene	ND		0.7
1,1,2-Trichloroethane	ND		1.15

ND = Analyzed for but Not Detected at the MDL

'on't on next page

Integrated Analytical Laboratories, LLC.

Integrated Analytical Labs

273 Franklin Road
Randolph, N.J. 07869

Phone: 973 361-4252
Fax: 973 989-5288

ANALYTICAL DATA REPORT
for
Isotec
51 Everett Drive
Suite A-10
West Windsor,NJ 08550
Project Name: MCLAREN HART/GANES CHEM. - 800204
Lab Case Number: 10990-6734

MDL = METHOD DETECTION LIMIT

Volatiles

Lab ID: 6734-007
Client ID: GW/T-D
Matrix-Units: Aqueous-μg/L
Percent Moisture: 100

Date Sampled: 11/8/99
Time Sampled: 09:39
Date Analyzed: 11/10/99

Compound	Conc	Q	MDL
Tetrachloroethene	ND		3.25
Dibromochloromethane	ND		1
Chlorobenzene	ND		0.85
Ethylbenzene	ND		1.25
Total Xylenes	ND		3.8
Bromoform	258		1.7
1,1,2,2-Tetrachloroethane	ND		1.85
1,3-Dichlorobenzene	ND		0.7
1,4-Dichlorobenzene	ND		1
1,2-Dichlorobenzene	ND		0.85
TOTAL VO's:	268.9		
TOTAL TIC's:	65		
TOTAL VO's & TIC's:	333.9		

ND = Analyzed for but Not Detected at the MDL

All required protocols were followed during analyses. These data have been reviewed and accepted by:

Michael H. Leftin, Ph.D
Laboratory Director

INTEGRATED ANALYTICAL LABORATORIES

VOLATILE ORGANICS

Tentatively Identified Compounds

Client/Project: ISOTEC/MCLAREN HART

Lab ID: 6734-007
Client ID: GW/T-D
Date Received: 11/08/1999
Date Analyzed: 11/10/1999
Date File: G6486.D

GC/MS Column: DB-624
Sample wt/vol: 1ml
Matrix-Units: Aqueous-μg/L (ppb)
Dilution Factor: 5
% Moisture: 100

CAS #	Compound	Estimated Concentration	Retention Time
000067-64-1	Acetone	42	4.41
	Unknown	23	10.60

Total TICs = 65

FAX #(973) ... CHAIN ... STODY ... lph, NJ 07869

CLIENT / PROJECT — **MAILING & BILLING**

Customer: ISOTEC	Send Report To: JIM REVAK
Address: 51 EVERETT DR. SUITE A-10 WEST WINDSOR, NJ 08550	Address: SAME
Telephone: (609) 275-8500	
FAX: 275-9608	Send Invoice To: SAME
Project Name: McLAREN HART / GANES CHEM.	Address:
Project Manager: Tom Andrews	
Reference ID# 800204 PO#: 1319	

Turnaround Time

Conditional / TPHC: 24 hr* 48 hr 72 hr 1 wk NA Other:

Verbal/Fax: 24 hr* 48 hr* 72 hr* ~~1 wk~~ 2 wk Other: Nov. 17, 1999

Hard Copy: 72 hr* 1 wk* 2 wk 3 wk Other: Nov. 24, 1999

*Prior to sample arrival, Lab notification is required.

Report Format: Standard / Regulatory / Reduced/Tier II / Other:

ANALYTICAL REQUESTS / PRESERVATIVES

Preservatives: 1. HCL 3. HNO 2. NaOH 4. H SO 5. Other 6. Other

COOLER TEMP. 5°C

SAMPLE INFORMATION

Sample Matrix: A - Aqueous, S - Soil, SL - Sludge, W - Waste, X - Other, O - Oil

Lab Case # 6734

Sample ID	Sample Description	Date	Time	am	pm	Matrix	# of Containers	Lab ID	V.O. +10	Fe, DISSOLVED	TOC	Comments
FIELD-MW4	FIELD COLLECTED	11/3/99				A	3	01	X	X	X	2 "FIELD" VO VIALS HAVE BUBBLES; USE FOR Fe & TOC ANALYSIS
GW/C-REG	CONTROL	11/8/99	9:20	X		↓	2	2	↓			
GW/C-OXY	CONTROL	↓	9:25	↓		↓	↓	3	↓			
GW/T-A	TREATED 1x	↓	9:28	↓		↓	↓	4	↓			
GW/T-B	↓ 2x	↓	9:32	↓		↓	↓	5	↓			
GW/T-C	↓ 3x	↓	9:36	↓		↓	↓	6	↓			
GW/T-D	↓ 1x	↓	9:39	↓		↓	↓	7	↓			

Concentrations Expected: LOW MED HIGH

Known Hazard: yes no

Describe:

CUSTODY LOG

	Sign	Date	Time	am	pm	Organization	Reason
Relinquished:	Jim Revak	11/8/99	14:00		✓	ISOTEC	LAB STUDY
Received:	[signature]	11/8/99	14:00		X	IAL	
Relinquished:	[signature]	11/8/99	16:40		X	IAL	
Received:	[signature]	11/8/99	1645		✓	IAL	ANALYSIS
Relinquished:							
Received:							

Comments: TOLUENE CONC. ≈ 20,000 ppb
- TREATED SAMPLES EXPECTED TO BE LOW CONC.'S. (<1,000 ppb)

6734

PAGE: 1 OF 1

LAB COPIES - WHITE & YELLOW; CLIENT COPY - RED

CHAIN OF CUSTODY

Case No.: 10990-6734 P.O. #: 1319
Project : MCLAREN HART/GANES CHEM. - 800204
Client/Project: ISOTEC/MCLAREN HART

Client Address:
Isotec
51 Everett Drive
Suite A-10
West Windsor, NJ 08550

Billing Address:
Isotec
51 Everett Drive
Suite A-10
West Windsor, NJ 08550

Date Received: 11/08/99
Time Received: 16:45
Report Format: Standard

Verbal Due: Nov 17
Report Due: Nov 22

# of Containers	3	2	2	2	2	2
IAL ID #	6734-001	6734-002	6734-003	6734-004	6734-005	6734-006
Client ID #	FIELD-MW -4	GW/C-REG	GW/C-OXY	GW/T-A	GW/T-B	GW/T-C
Matrix	Aqueous	Aqueous	Aqueous	Aqueous	Aqueous	Aqueous
Sample Date	11/03/99	11/08/99	11/08/99	11/08/99	11/08/99	11/08/99
Sample Time	:	09:20	09:25	09:28	09:32	09:36
VO+10, PP LIST	√	√	√	√	√	√
Fe-Iron	√					
TOC	√					

ıts: NOTE 1: AS PER COC, TOLUENE CONC. OF 20,000 ppb EXPECTED IN SAMPLE #1 - #3. LOWER CONCENTRATIONS EXPECTED IN REMAINING SAMPLES(<1000 ppb).

NOTE 2: SAMPLE #1 FOR DISSOLVED FE ALREADY PRESERVED. AS PER JIM R., UNPRESERVED SAMPLE STILL AT OFFICE. WILL BE PICKED UP BY IAL 11/9/99. 11/9/99 (ES)

NOTE 3: TOC VIAL PRESERVED W/ HCl. AS PER ROB B., OK TO RUN. 11/9/99 (ES)

CHAIN OF CUSTODY

Case No.: 10990-6734
P.O. #: 1319
Project : MCLAREN HART/GANES CHEM. - 800204
Client/Project: ISOTEC/MCLAREN HART

Client Address:
Isotec
51 Everett Drive
Suite A-10
West Windsor, NJ 08550

Billing Address:
Isotec
51 Everett Drive
Suite A-10
West Windsor, NJ 08550

Date Received: 11/08/99
Time Received: 16:45
Report Format: Standard

Verbal Due: Nov 17
Report Due: Nov 22

# of Containers	2
IAL ID #	6734-007
Client ID #	GW/T-D
Matrix	Aqueous
Sample Date	11/08/99
Sample Time	09:39
VO+10, PP LIST	√

nts: NOTE 1: AS PER COC, TOLUENE CONC. OF 20,000 ppb EXPECTED IN SAMPLE #1 - #3. LOWER CONCENTRATIONS EXPECTED IN REMAINING SAMPLES(<1000 ppb).

NOTE 2: SAMPLE #1 FOR DISSOLVED FE ALREADY PRESERVED. AS PER JIM R., UNPRESERVED SAMPLE STILL AT OFFICE. WILL BE PICKED UP BY IAL 11/9/99. 11/9/99 (ES)

NOTE 3: TOC VIAL PRESERVED W/ HCl. AS PER ROB B., OK TO RUN. 11/9/99 (ES)

INTEGRATED ANALYTICAL LABORATORIES, LLC

SAMPLE RECEIPT VERIFICATION

CASE NO: № 6734 CLIENT: Isotec

COOLER TEMPERATURE: 2° - 6°C: ✓ (See Chain of Custody)

CHAIN OF CUSTODY: COMPLETE / INCOMPLETE Comments:

		Comments:
Sample Bottles Intact:	✓	
Sample Labels Intact/ Correct:	✓	
Sufficient Sample Volume:	✓	
Correct bottles/ preservative:	✗	Field MW-4 has 3 VO vials pres w/HCl ⇒ no unpreserved for D. Fe or pres w/H_2SO_4 for TOC
Samples received in holding time/ prep time:	✓	
Headspace/ bubbles in voa samples:	✓	bubbles in all vials
Samples to be subcontracted:	N/A	
Preserved Sample pH checked: (Excluding voa samples)	N/A	

KEY

✓	= YES
✗	= NO
(✓)	= N/A

ADDITIONAL COMMENTS:

SAMPLE(S) VERIFIED BY: INITIAL AG DATE 11-9-99

CORRECTIVE ACTION REQUIRED: **YES** ✓ **NO** ☐

CLIENT NOTIFIED: YES ✓ Date/ Time: 11/9 AM NO ☐

PROJECT CONTACT: Jim Rovak

SUBCONTRACTED LAB:

DATE SHIPPED:

CORRECTIVE ACTION BY CLIENT: will send up more unpreserved sample for Dissolved Fe.

CORRECTIVE ACTION TAKEN: Will p/u dissolved Fe today

CONCLUSION: As per Rob B OK to run TOC on HCl preserved vial.

Corrective Action taken by: INITIAL ES DATE 11/9

REV 5/99

Integrated Analytical Laboratories, Inc.

Laboratory Custody Chronicle

Case No : 10990-6734
Client : Isotec
Project : MCLAREN HART/GANES CHEM. - 800204

Date sampled from: 11/08/99 to: / /
Date Received : 11/08/99

Custody Seal	Present/Absent
	Intact/Not Intact
Chain of Custody	Present/Absent
Sample Tags	Present/Absent
	Listed/Not Listed on C.O.C
Shipping Bill	Present/Absent No.
Cooler Conditions	5°C Temp
Sample(s) Conditions	

			EXTRACT DATE	EXTRACT TIME	EXTRACT INITIAL	ANALYSIS DATE	ANALYSIS TIME	ANALYSIS INITIAL
	GC/MS V							
VO+10, PP LIST	6734-001	A				11/8-11/10/99		DSD
	6734-002	A						
	6734-003	A						
	6734-004	A						
	6734-005	A						
	6734-006	A						
	6734-007	A						
	METALS							
Fe-Iron	6734-001	A	11/11/99			11/11	12:00	
	WETCHEM							
TOC	6734-001	A				4/9	1300	

REVIEW & APPROVAL: MColatzer

REMARKS :

Appendix G

Quality Assurance Project Plan

1.0 QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) has been developed to establish procedures for all field activities, analytical methods and quality assurance measures for investigative activities at the Ganes Chemicals, Inc. site, herein referred to as "Site, Property or Facility". All project activities will be conducted in accordance with this QAPP and the Remedial Investigation Workplan dated October 13, 1999. The procedures outlined in the QAPP are based on the Technical Requirements for Site Remediation (TRSR) (N.J.A.C. 7.26E) and New Jersey Department of Environmental Protection's (NJDEP's) May 1992 Field Sampling Procedures Manual.

The QAPP will ensure that field sampling procedures, analytical methods, and chemical analytical data are of sufficient quality to meet the intended usages. As specific conditions and additional information warrant, this QAPP will be amended or revised to include site-specific quality assurance/quality control (QA/QC) procedures.

1.1 EQUIPMENT DECONTAMINATION

1.1.1 General Preparation

Sampling equipment (e.g., hand augers and trowels) will be cleaned and wrapped in aluminum foil prior to arrival on-site, if possible. Whenever possible, sampling equipment will be dedicated to one sampling location. When it is not possible to dedicate sampling equipment, field decontamination will be performed in accordance with the procedures outlined in Section 1.1.3.

Large equipment such as backhoes, drill rigs and ancillary equipment (e.g., split-spoon samplers) will be decontaminated prior to the start of field activities. Decontamination will consist of a pressurized hot water "steam" wash on a decon pad. The decon pad will be constructed of plastic sheeting with bermed sides to prevent runoff. The pad will be constructed in a location agreed upon by Ganes Site contact and McLaren/Hart. All PVC well casings and screens for temporary well-points and permanent well installations will be kept wrapped in plastic prior to use.

1.1.2 Cleaning Materials

Laboratory grade detergent will be a standard brand of phosphate-free detergent such as Alconox or Liquinox. Pesticide-grade acetone, methanol or hexane will be used as cleaning solvents. Tap water will be taken from the municipal water supply on-site. ASTM type II, distilled, deionized, analyte-free water will be used as the final water rinse.

1.1.3 Field Decontamination Procedures

Sampling equipment will be decontaminated prior to each use according to the NJDEP Field Sampling Procedures Manual (Chapter 2, Section C). The following general steps will be used for all aqueous sampling.

- Wash and scrub with laboratory-grade, non-phosphorus detergent and tap water.
- Rinse generously with tap water, next rinse with ASTM type II deionized, distilled, analyte-free water.
- Acetone rinse.
- Rinse generously with ASTM type II deionized, distilled, analyte-free water.
- Rinse with acetone, methanol or hexane and allow to evaporate.
- Rinse generously with ASTM type II deionized, distilled, analyte-free water.
- Air dry

The solvent rinse (e.g. acetone) is used when samples will be analyzed for organics (VOCs). The decontamination procedure for non-aqueous samples will include the same sequence of steps listed above if visual contamination persists or gross contamination is encountered or suspected.

Large equipment will be decontaminated by steam pressure washing. After the initial equipment cleaning, decontamination of drilling and excavating equipment will be reduced to areas of the equipment which are in contact with, or in close proximity to the materials being sampled. Auger flights, drill rods and bits will be cleaned between each sampling location. Split-spoon samplers will be decontaminated between each use.

1.2 TECHNICAL OVERVIEW

This section provides a summary of the field methods to be used for the additional remedial investigations and activities at the Site. All field activities will be conducted in accordance with the TRSR, Sections 7:26E-3 and 7:26E-4, and NJDEPs Field Procedures Manual.

1.2.1 Drilling and Split-Spoon Sampling

Soil borings and sampling will be conducted in accordance with 7:26E-4.3 (Remedial Investigation of Soil). All test boring drilling will be conducted by a New Jersey-licensed driller using a truck-mounted mud rotary and hollow-stem auger drill rig. All test borings will be logged in the field and will include a description of subsurface conditions, photoionizing detector (PID) readings, and a classification of soils (e.g., Unified Soil Classification System, Burmeister, USDA).

The general procedure for field screening and selection of samples for laboratory analysis will be as follows:

- Open split-spoon and lay on clean working surface;
- Score or slice length of core with decontaminated knife or stainless-steel spatula;
- Field screen along length of soil core and record PID readings in 6-inch increments; and
- Collect a soil sample from the pre-selected interval and/or 6-inch interval having the highest PID reading and/or other evidence of contamination (e.g., discoloration).

If continuous split-spoon sampling is conducted, sample selection will be conducted by placing 6-inch sample intervals in ziplock plastic bags and using a PID to field screen the headspace for organic vapors. Split-spoons will be advanced until no PID readings above background are detected.

When a six-inch interval will not be recoverable due to poor recovery or other field logistical problems, an explanation will be provided in the soil log. Samples for volatile organic compound (VOC) analysis will be collected in accordance with the NJDEP methanol extraction procedures. Samples will be collected by transferring soils from within the selected six-inch interval directly from the split-spoon to a lab-provided sample jar. Soil samples will be collected into laboratory-supplied glassware and immediately placed in ice-filled coolers for preservation. The samples will be shipped to a New Jersey certified laboratory with the proper chain-of-custody documentation to insure the integrity of the samples (as outlined in Section 1.7).

Following completion, test borings will be grouted or backfilled, as appropriate, based on test boring depth. Test borings completed in paved areas or inside buildings will be restored by patching with asphalt or cement.

1.2.2 Monitoring Wells

Monitoring well installations will be completed in accordance with 7:26E-4.4 (Remedial Investigation of Groundwater), the Field Procedures Manual and the NJDEP Alternate Groundwater Sampling Techniques Guide dated July 1994.

Water levels will be collected for all monitoring wells from PVC and ground surface following installation. All wells will be checked for Non-Aqueous Phase Liquid (NAPL) using an electronic oil-water interface probe. Following installation, wells will be developed by purging approximately 10 volumes of water or until water is clear and turbidity readings have stabilized. The well development rate will not exceed the yield of the well. Purging will be conducted using a submersible pump and dedicated tubing. Wells will be surged periodically to insure development of the entire well screen and removal of residual drilling fluids.

1.2.3 Groundwater Sampling

Monitoring well sampling will be conducted in accordance with 7:26E-4.4 (Remedial Investigation of Groundwater) and low-flow sampling plan provided as Attachment B. The general procedure for purging and sampling will be as follows:

- Prior to purging, measure water levels and sound each well from top of inner casing;
- Check all wells for NAPL using an electronic oil-water interface probe;

- Purge calculation: (well depth – water level)*well diameter^2(inches)*0.0408 = one volume (gallons);
- Purge wells in accordance with the low-flow plan using a peristaltic or low-flow submersible pump (< 1 gpm flow rate);
- Record all purge and sampling information on monitoring well log forms;
- Collect field parameters before and after purging and after sampling for pH, conductivity, ORP, temperature and Dissolved Oxygen (DO);
- Ground water samples will be collected using dedicated teflon or polyethylene (PE) bailers.

Wells will be purged at a rate that minimizes the amount of drawdown. If a well is pumped dry during purging, it will be allowed to recharge enough to allow for sample collection.

1.2.4 Drilling and Decontamination Fluids, Well Development and Purge Water

Drilling fluids (e.g. drilling mud) and development and purge water generated from new and existing wells will initially be containerized 55-gallon drums staged at each well. Each drum will be labeled using a paint-marker and a non-hazardous label with the following information: well number, date and time of generation and drum contents.

Decontamination of drilling equipment will be conducted in a central location on-site. Decontamination fluids will initially be containerized in a temporary decontamination pad constructed with plastic sheeting and wood and then pumped out into 55 gallon drums. Decontamination of sampling tools (split-spoons, trowels, etc.) will be conducted at each area of investigation. These decon fluids will be held in smaller (e.g., 5 gallon buckets) and then emptied into a 55 gallon drum staged near the central soil stockpile.

1.3 Field Measurements and Equipment Calibration

Field measurements for this investigation will include the following parameters:

✓ Depth to water (DTW) and depth to NAPL (DTN);

- ✓ pH, Temperature, Conductivity;
- ✓ Dissolved Oxygen (D.O.);
- ✓ Oxidation-Reduction Potential (ORP);
- ✓ Dissolved iron concentrations in groundwater;
- ✓ VOC concentrations in groundwater; and
- ✓ Organic vapor concentrations in air.

Field measurements for ground-water sampling will be obtained in the following order to insure accuracy: organic vapors in well casing using PID, DTN, DTW, D.O., temperature, ORP, pH, conductivity and iron. All measurements will be made immediately upon collection. All non-dedicated equipment will be decontaminated between samples. All standard field parameters (e.g., DO and ORP) will be measured using a flow-through cell.

Initial calibration of field instruments will be performed by a qualified technician prior to mobilization of equipment to the Site. Equipment calibration onsite will be performed on a daily basis, or more frequently as specified by the manufacturer's instruction manual. The recorded calibration information will include date of calibration, standards used and calibration results.

1.4 SAMPLE IDENTIFICATION

Each sample collected will be assigned a sample designation according to a pre-determined numbering system. The sample designation will include in abbreviated form: the sample location (AOC), the sample type (e.g. post-excavation), the sample number and the depth interval (where applicable). The following sample identifications will be used:

Soil borings – SB
Post-Excavation samples – PE
Sediment samples – SED

For example, post-excavation soil boring sample number two collected from Area E from 3-4 feet will be labeled as follows: E-SB-2 (3-4). The label for each sample will include the sample designation and the following additional information:

- Site name;
- Date sampled;
- Time sampled;
- Sampler name; and
- Analysis requested

Sample designations will be written in indelible ink, attached to each sample container and then sealed with clear tape. Each container will be labeled by the sampling individual in an effort to avoid the possibility of sample misidentification. Each sample will be assigned a unique laboratory identification number that will be used for analysis assignment, sample tracking, and data reporting while the samples are at the laboratory.

1.5 SAMPLE HANDLING AND PRESERVATION

All samples will be handled in accordance with the field procedure's manual and the NJDEP Methodology for the Field Extraction/Preservation of Soil Samples with Methanol for VOCs. Any deviations from these protocols will be recorded in the field logbook.

1.6 FIELD DATA DOCUMENTATION/FIELD LOGS

A system of logging all pertinent data collected during sampling operations will be maintained using bound field logbooks. All entries will be made in ink. Errors will be crossed out with a single line, initialed, and dated. At the completion of the day, if a page is not complete, a diagonal line will be drawn through the remainder of the page with the signature at the bottom.

All sample locations will be recorded and referenced to the site map so that each location is permanently established. Samples will be tagged or labeled with all pertinent site information at the time of sampling. Pertinent site information to be supplied in the field logbook for each task is listed below:

- Signature of note taker;
- Name and location of investigation;
- Date and time of arrival and departure;
- Names of all personnel onsite and their affiliation;
- Purpose of the visit'
- All field instruments used, date and time of calibration and calibration checks, method of calibration, standards used;
- All field measurement results;
- Date, time, and location of all sampling points;
- Method of sample collection;
- Any factors that could affect sample integrity;
- Name of sampler(s);
- Sample identification and sample description;
- Document all conversations with the client, agency personnel, field decisions, and approval;
- Sample location/interval rationale; and
- Weather conditions.

Field logbooks should contain only factual information entered as real-time notes, which will enable the user to recreate events on-site. Drilling logs and boring logs will be recorded in a bound field notebook for each boring. Groundwater sampling field data will be recorded in the field notebook for each monitoring well sampled. Field notebooks will be kept in the project file.

1.7 SAMPLE CUSTODY PROCEDURES

Proper custody procedures are described below.

1. Empty clean sample containers will be relinquished by the laboratory on the chain-of-custody record. The chain-of-custody record will be used for all samples collected.
2. Any transfer of custody of containers or samples will be noted on the chain-of-custody record.
3. Each sample collected for the project will be entered on the chain-of-custody report.

4. The original chain-of-custody record will accompany the sample containers during transport to document their custody.
5. If custody is relinquished through a common parcel carrier for delivery to the laboratory, the following protocol will be followed:
   a. The airbill number (if applicable) will be entered on the original chain-of-custody record.
   b. The original chain-of-custody record will be placed inside the shipping package.
   c. The shipping package will be sealed with strapping tape in such a manner that the package cannot be opened without breaking the tape.
6. The following information must be supplied to complete the chain-of-custody record:
   a. Project name;
   b. Signature of samplers;
   c. Sample designation, date and time of collection, grab or composite sample designation, and brief description of the type of sample and sampling location;
   d. Signatures of individuals involved in sample transfer, i.e., relinquishing and accepting samples. Individuals receiving the samples shall sign, date, and note the time that they received the sample on the form; and
   e. In the lower right comment section, the type of carrier service will be indicated.

2.8 Quality Assurance and Quality Control Samples

Quality Assurance and Quality Control (QA/QC) samples for this investigation will include field blanks, trip blanks, and field duplicates. Details regarding the methods for collection and handling of these samples are provided in the following sections.

2.8.1 Field Blanks and Trip Blanks

Field (rinsate) blanks, in the form of equipment rinse blanks, are required for each phase of sampling for which field-sampling equipment will be used. Field (rinsate) blanks will be collected by pouring demonstrated analyte-free water over decontaminated sampling equipment as a check that the decontamination procedure has been adequately carried out and that there is no cross-contamination of samples occurring due to the equipment itself.

Analyses of field (rinsate) blanks will be performed for all analytes of interest. For soil samples, a field blank will be collected at a rate of 10 percent of the total number of samples per sampling event with a maximum of one field blank per sampling day. For groundwater samples, a field blank will be collected for each sampling day.

Trip blanks will be analyzed for aqueous volatile organic sampling events only. Trip blanks will be prepared at a rate of one per sample shipment, and shall not be held on site for more than two calendar days, with one day for transport from the laboratory to the site and one day for return.

2.8.2 Field Duplicate Samples

Duplicate samples consist of an actual sample taken in the field that has been split into two identical aliquots and put into two separate sampling containers. Duplicates of soil samples (except for the VOC fraction) will be homogenized in a stainless steel pan prior to filling the appropriate sample containers. A volume of soil sufficient to fill the sample bottles will be collected from the depth or interval of concern and placed in a stainless steel bowl. Using a stainless steel spoon or spatula, the soil will be scraped from the sides and bottom of the pan into the middle, and mixed thoroughly. The sample will then be quartered and moved to the edges of the pan.

The volatile fraction of duplicate soil samples will be collected from the identical interval (where practicable) as the sample being duplicated. After mixing each quarter, they will be rolled back to the middle of the pan, and the entire sample mixed again. After homogenizing the sample, it will be split into equal portions, with sample bottles filled by alternately scooping soil from the portions. The samples are then transported to the laboratory and analyzed as two separate samples. The results will be used to assess laboratory accuracy and precision of sampling and analysis.

Duplicates of water samples will be obtained by alternately filling sample containers from the same sampling device for each parameter. Samples for volatile organics VOA will be filled from the same bailer full of water and will be the first set of containers filled. VOA vials will not be alternately filled.

A field duplicate will be collected at a rate of five percent of the total number of soil samples collected or one every 14 days if less than 20 samples are collected during the 14 day period.